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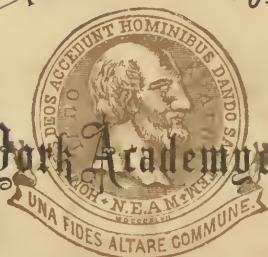


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# A TEXT-BOOK FOR TRAINING SCHOOLS FOR NURSES

INCLUDING  
PHYSIOLOGY AND HYGIENE  
AND THE  
PRINCIPLES AND PRACTICE OF NURSING

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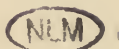
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A TEXT-BOOK FOR  
TRAINING SCHOOLS FOR NURSES.



# A TEXT-BOOK FOR TRAINING SCHOOLS FOR NURSES.

## CHAPTER I.

### LOCAL APPLICATIONS ; POULTICES, ETC.

A *poultice* (cataplasme) is a mixture of certain substances with hot water into a mass of even consistence, for an application to some part of the body, and is chiefly used as a means of applying warmth and moisture. Its effect is to soften the tissues and relax the tension of the skin.

Poultices may be made from linseed meal, bread, flour, starch, slippery-elm bark, spices, and various other materials. The requisite is that the material shall be capable of conveying moist heat to the parts, and not be especially irritating to the skin. Linseed meal<sup>1</sup> is commonly used, as it is cheap and convenient, contains some oil, and retains the heat.

The poultice should be several inches larger than the

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<sup>1</sup> To make a linseed-meal poultice, the meal should be stirred slowly and evenly in a saucepan of boiling water, and then boil for a moment afterward, while stirring briskly, until it is free from lumps. When finished it should be smooth paste that will not drop from the dish. This should be spread evenly upon a piece of muslin the proper size, not to exceed half an inch in thickness. A margin of cloth should be left to turn in. The surface should be spread with sweet oil or vaseline to prevent it from sticking. Some thin material should then cover it and fold over the edges. It can then be rolled up and covered with a towel to retain the heat.

inflamed area, and covered with rubber, oiled silk, paper, or other material that will retain the heat and moisture. It can be secured in place by a roller or many-tailed bandage. As a rule it should be renewed every 2 to 4 hours. It should be applied as hot as it can be borne, and should not be allowed to become cold and stiff. A poultice should never be used again.

*Starch* makes an admirable poultice on account of its bland qualities, and is particularly adapted for skin diseases. It should first be mixed with cold water and then with boiling water to make a thick paste. Then it should be applied in the same manner as a linseed poultice.

*Charcoal*, mixed with bread or linseed meal, being antiseptic, is a desirable dressing for putrid and gangrenous sores. It is, however, a dirty and discoloring substance, and for this reason is objectionable. It is not as advantageous as the yeast poultice.<sup>1</sup>

An *ice* poultice is sometimes desirable in the absence of ice-bags. It is made by spreading a layer of cracked ice between two layers of bran and confining the whole in a bag. When the bran is soaked and the water begins to run through, it must be renewed.

*Fomentations* or *stupes* are cloths soaked in hot water or medicaments, or heated dry for application to the surface of the body. They are employed to keep up the vitality of the parts, particularly in contused wounds, and applied to affected parts to relieve pain

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<sup>1</sup> Mix yeast with water at blood heat in equal proportions by weight, stirring in wheat flour to the combined weight of the former. It should be left in a warm place to rise, and application should be made during the fermenting process, in a loose bag.

from muscular spasm.<sup>1</sup> They can be covered with oiled silk to keep in the heat.

*Moist heat* has a more penetrating effect than dry heat. In acute inflammations that have a tendency to suppurate, moist heat appears to hasten the process. It relaxes the tissues, dilates the capillaries, and increases the activity of the white blood corpuscles. Where the application is not to be prolonged, hot, moist fomentations are used, but where it is to be applied for some time, poultices are preferable.

*Dry heat* by hot flannels or dry fomentations are sometimes used in inflamed joints and in colic. Dry heat does not relax the tissues. Salt-bags and bran-bags made very hot are also used, especially when heat is applied about the head for earache, etc. Salt retains the heat for a long time. Hot-water bottles or rubber bags containing from one-half to two gallons are very useful for applying dry heat. They should always have a flannel covering, and a good plan is to have flannel sacks into which they can be slipped before they are applied.

*Turpentine stupes* are made by sprinkling a half drachm of the spirits of turpentine over the surface of the hot, wet flannel before applying it. It may cause vesication if allowed to remain too long in contact with the skin. If the patient complains of severe burning

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<sup>1</sup> Flannel is the best material for hot fomentations or stupes. Two pieces should be provided, double the required size. They should be dipped in boiling water and wrung out by the use of sticks, as dry as possible; small compresses may be wrung out by a lemon squeezer; or, they may be put in a towel and the towel twisted, the purpose being to have them applied as hot as possible. They should also not be wet enough to run off on the bedding. There should be one preparing while the other is in use.



of the skin after the use of turpentine, it can be smeared with vaseline. Laudanum may also be added, or the cloth may be steeped in a decoction of hops, chamomile, etc.

*Cold applications*, aside from the general application of cold, as in baths, are very important at times, in the treatment of inflammations and to check the determination of blood to a part. The important precaution necessary in their use is that the cold be sustained, regular and not excessive. Cold acts in contracting the walls of the capillaries, thus lessening the amount of blood supplied to the part. The use of cold in hæmorrhage has been treated elsewhere.

*Cold-water dressings* are applied by bringing the cold water either directly in contact with the body or applying it by means of a rubber bag or coils. The temperature of the water may vary from cool to ice-water.

*Cold compresses* may be made by several thicknesses of lint wrung out of cold water and changed frequently. The water should be kept at an even temperature. If colder applications are needed, one compress can rest upon a block of ice while the other is in use, and they can be changed frequently. Care should be taken not to wet the bedding or the clothing of the patient.

*Ice-bags*, either of rubber or made from bladders, is an effectual way of applying the greatest degree of cold. Rubber bags are provided now in almost every shape desired, to fit the head, or long and narrow to fit the spine. The bag should not be filled or it will be clumsy, and the air should be expelled from the bag. The ice should be broken into pieces not more than one inch square, and the supply should be renewed from time to time. If it is not desired to have the greatest

degree of cold and to preserve the ice, sawdust or bran can be mixed with it. If an intense cold be desired, a little common salt can be mixed with the ice. A cloth cover may be made for the ice-bag, and it can then be fastened to the pillow. It is also well to protect the skin by a layer of moist lint. A good way to break ice is to put it into a stout canvas bag or cloth and pound it. A very uniform and effectual means of applying cold to a limb is by the *coil* (Fig. 1). A flexible tube of rubber half an inch in diameter is wrapped about the limb like a spiral bandage and held in place by a small roller. One end of the tube is placed in a pail filled with cold water, and the water flows through the tubing and escapes into another pail. In this way also cold can be applied to the head, breast, and almost any part by sewing the tubing in circles on a piece of cloth or rubber.



FIG. 1.—ICE-COIL WITH FLEXIBLE RUBBER TUBE.

## CHAPTER II.

### COUNTER-IRRITANTS ; CUPPING ; LEECHES.

*Counter-irritants* are agents which by their irritant action increase the flow of blood to one part, and thus attract it from another part. They first cause congestion, and if continued cause inflammation, and are used to relieve similar states in other parts. An irritant to the surface causes dilatation of the capillaries where it is applied, and through reflex nervous action contraction of the capillaries in other parts.

They may be divided into *rubefacients*, *vesicants*, *suppurants*, *cauterants*, but this division is arbitrary, as any of the several classes may effect the several results desired by limitation of their application ; hence, a rubefacient may cause vesication if applied for a sufficient length of time, etc.

Counter-irritants may produce a mild irritation or reddening of the surface, which quickly passes off, and, if continued, a more permanent congestion ; if pushed further, inflammation is produced, and the next degree is vesication, or blistering. Counter-irritation is seldom carried beyond the latter degree, but it may be, resulting in sloughing and necrosis of the adjacent tissues.

They are usually applied over or near the seat of the disease, but are sometimes applied to a remote part ;

such as a mustard foot-bath for the relief of pain in the head or abdomen.

The principal rubefacients are mustard, ammonia, turpentine, capsicum, and pitch. Still milder counter-irritants may be gained by the use of spices in poultices or from the various liniments.

The most commonly used irritant is mustard, and this is usually mixed with from one to three times its weight of flour or linseed meal and mixed into a paste with tepid water. It is spread evenly upon a piece of muslin which should be sufficiently large to fold over and cover the poultice. Tepid water is used because hot water reduces the strength of the mustard. The feeling of cold when it is applied soon passes away. It should not be left on any longer than necessary to gain the desired result, which may be expected in from ten to twenty minutes. A blister made with mustard is very painful and difficult to heal. In unconscious patients, particular care must be given, as the patient is unable to notify the nurse, and a blister resulting in such a case would be evidence of neglect. For children, the proportion of mustard should be smaller, and mixed with linseed meal instead of flour. The addition of an ounce of glycerine, or the white of an egg, in mixing the mustard will usually prevent a blister. When the mustard is removed and it is desired to continue the irritation, a linseed-meal poultice can be applied. The smarting can be relieved by anointing the part with vaseline and dusting with rice powder or fine starch. Mustard leaves and prepared mustard plasters, now sold in drug stores, are convenient, but are not equal to the mustard plaster described above.

When an immediate effect is desired, *ammonia* is to

be preferred as a rubefacient. A piece of lint or a folded handkerchief dipped in strong ammonia and laid upon the skin of the patient acts instantly. Such an application to the nape of the neck will often rouse a patient from a profound state of coma. In opium poisoning, and wherever a sudden revulsive is needed, this agent is to be preferred.

*Capsicum* mixed into a paste, with from 5 to 10 times its weight of flour, spread like a mustard plaster, is effective; or red pepper spread upon the inside of two pieces of flannel and applied as a stupe acts quickly and effectively. Turpentine is usually applied in the form of stupes. In addition to the sprinkling of turpentine on the hot fomentation, a tablespoonful may be mixed with a pint of boiling water and the flannel wrung out of this.

A very mild rubefacient is the *pitch plaster*, especially that of Canada pitch. It is chiefly employed in chronic bronchitis and in muscular rheumatism. The tincture of *iodine* is an effectual rubefacient, the objection to it being the great discoloration it produces. It is painted over the affected part with a camel's-hair brush, and the application may be repeated two or three times. *Chloroform* is usually used in liniments but may be used alone. If left on too long it will blister.

The *vesicant* (blister) usually employed is cantharides. It should always be applied to the sound skin, and if it is tender some thin substance should be placed over the skin before the application of the blister, preferably oiled tissue-paper. The physician directs the location for the blister and the size of the plaster. The skin should be thoroughly cleaned with soap and water,

or alcohol. If there is much hair it should be shaved off. The plaster should be secured in its place by narrow strips of adhesive plaster, but a roller is preferable if the parts admit of its application. Whatever is applied should be loose, to leave room for the blister to rise. The blister should rise in from four to eight hours. If it is not formed in ten hours, remove the plaster, and apply a hot linseed poultice, or the poultice may be applied over the plaster. In removing the plaster, care should be taken not to break the skin, and it should be cleaned off, using oil, and all adhering particles removed. After the blister is well filled, make a small opening for the fluid to escape, catching it in a pledget of cotton. The skin must not be removed. The physician may direct that the fluid shall be left in the blister. Dress the sore with oxide of zinc, either in powder sprinkled on, or with the ointment applied on lint and kept in place with an adhesive strap.

Cantharides sometimes produces a serious condition of the urinary apparatus, particularly if there exists any kidney disease, or the blister is put on in the region of the kidneys. Blisters have also been said to have produced premature labor.

Cantharides is sometimes used in the form of a liquid mixed with collodion, and called *cantharidal collodion*. The space to which it is to be applied should be bordered with vaseline to prevent it from spreading, and it should then be applied with a camel's-hair brush, and afterwards covered with lint or absorbent cotton.

Chloroform and ammonia can be used to raise a quick blister. A piece of lint or cotton saturated with either is placed upon the skin and covered with any-

thing that will prevent evaporation. Care should be taken in blistering patients with feeble circulation.

*Croton oil* rubbed into the skin with a piece of flannel (not exceeding 5 drops) produces an eruption of vesicles, and is a powerful irritant. It is now seldom used.

Leeches are spindle-shaped worms, with suckers at each extremity, used in medicine to abstract blood from the body. They are only used when a small quantity of blood is to be removed locally, and as the same result can be obtained by wet cupping, they are now seldom ordered.

There are two varieties, the American and foreign, and they can be distinguished by the stripes upon the back, the former having but two and the latter six. A leech will draw three or four times its own weight of blood. They are found in stagnant water and must be kept in covered jars ventilated at the top. The jar should be half filled with water, with a layer of mud on the bottom. They should never be used twice.

Before leeches are applied, the skin should be thoroughly cleansed with soap and water and alcohol, and thoroughly dried. The leech also should be clean. It can then be put in a medicine glass or a glass tube, head downwards and placed upon the part. Sometimes leeches are sluggish and refuse to take hold. Touching the spot with cream, or drawing a drop of blood with a pin, may start them. They should never be applied over a blood-vessel, but preferably over a bony part, so that in case of troublesome bleeding, pressure can be made over the part. A leech should be left on from a half to one hour; when filled they will drop off, or if it is desired to take them off sooner, the application of a little salt will loosen them. They should never be



removed by force. After the leech is removed, if it is desired that the bleeding should continue, hot fomentations or poultices can be applied ; or if the bleeding is to be checked, a compress or application of ice will accomplish it ; or, if it is obstinate, touch the point with a solution of iron, or a stick of lunar caustic.

*Cupping* may be wet or dry. The former acts as a counter-irritant and removes the blood, and the latter is a counter-irritant only. It is accomplished by glasses made for the purpose, but when they are not to be had, wineglasses or small tumblers can be used. For dry cupping there is needed a spirit-lamp, a saucer of alcohol, a probe with a wad of cotton tied on the end, and towels. The cups should be perfectly dry. Take the probe, dip it in the alcohol and light it, and let it burn for several seconds in the inverted glass, or swab the glass with it, then withdraw the light and instantly apply the cup. As the air begins to cool, the skin will be sucked up into the glass and the blood will be drawn toward the surface. Care must be exercised not to let the cup get so heated as to burn the patient, and see that no burning alcohol is left in the cup to run down on the skin. They should be left on five minutes. To remove them, insert a probe at the edge of the glass and let the air enter. Poultices are sometimes applied after their removal. Wet cupping is effected in the same manner, except that the skin is scarified, either by a *scarificator* or a lancet before the cups are applied. The skin should be cleansed and afterwards washed with carbolic solution. After sufficient blood is withdrawn bleeding can be checked in the usual way ; a lint compress can be placed over the wound and held with a roller.



*Venesection* consists in opening a vein, and it is the operation by which blood is removed from the body. It is usually performed at the bend of the elbow. The patient's arm should be carefully cleansed and washed with an antiseptic. A few turns of a roller should be applied around the middle of the arm tight enough to



FIG. 2.—PREPARATION FOR  
VENESECTION.

make the veins stand out below. The patient grasps a broomstick or similar article and works his fingers on it (Fig. 2). Then the superficial vein at the elbow is steadied with the thumb and the point of the lancet beneath it, and cut quickly outward, making a free opening. When a sufficient amount of blood is withdrawn, the thumb is placed over the wound and the bandage is removed. The wound is then washed with bi-chloride, and a compress of sterilized gauze is applied and held by a roller, which should envelop the whole upper extremity. Do not disturb the dressing for five days.

## CHAPTER III.

### ENEMATA ; SUPPOSITORIES.

AN *enema* (plural, *enemata*) is a rectal injection of a fluid for remedial or nutritive purposes. They are also termed *clysters* and *lavements*.

The *varieties* of enemata are purgative, antispasmodic, astringent, emollient, anthelmintic, stimulating and nutrient.

To give an enema, the patient should be placed upon his left side <sup>1</sup> for the purpose of retaining the liquid by gravity, after the bed has been protected by a rubber sheet, etc. Care must also be taken to have a vessel at hand in case the enema is not retained. Fill the syringe with the liquid by passing it through several times (air should never be allowed to remain in the syringe), then oil the nozzle and insert it very gently upwards and slightly backwards. After it is partly introduced, allow the point to swerve slightly towards the left, following the axis of the rectum. The force used should be no greater than the natural weight of the syringe. If there is an obstruction, discharge the syringe slightly, remove it, and wait for the rectum to unload ; or it may be necessary to remove some of the fæcal matter to introduce the syringe. The patient should not be uncovered to administer an enema.

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<sup>1</sup> The rectum is directed to the left, to join with the descending colon on the left side of the abdomen.

Syringes are of various patterns, but the common bulb syringe of rubber, with a hard rubber or metallic tube, answers every purpose. For a small medicated enema, the piston syringe is preferable, as the liquid can be measured with greater accuracy. A soft rubber tube can be introduced high into the colon to which a bulb syringe may be attached by slipping the tube over the nozzle of the syringe. Ordinarily a small size soft rubber feeding tube will suffice, but if it has a tendency to double on itself, a No. 12 elastic male catheter may be used, softening it by immersion in hot water before using; this is termed a *high* enema. The enema can also be introduced by gravity (*douche*), the liquid being contained in a vessel a few feet above the patient, and connected to the nozzle by a rubber tube.

A simple enema is used for cleansing and laxative purposes, and consists of a light suds made with common or castile soap, or pure water may be used. It should be warm (95° F.), neither hot nor cold, as the extremes of temperature cause too active peristalsis. Plenty of time should be taken to give an enema. The flow should be slow and steady; any sudden discharge of fluid in the rectum causes an intense desire to expel it. If there is distress, the flow should be checked for a moment until it passes away. When the desire to expel the fluid seems uncontrollable, pressure against the anus for a few moments will relieve it. In this way a large quantity of fluid may be thrown into the colon.<sup>1</sup> After the requisite amount has been intro-

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<sup>1</sup> It was demonstrated by Haller in 1767 that an enema could be forced through the entire alimentary canal and be ejected from the mouth.

duced, gently remove the tube, and allow the water to run out of the syringe. By continuing the compress against the part, the enema may be retained for some minutes.

For laxative purposes, olive oil, glycerine, and a solution of inspissated ox-gall is used. The latter is an admirable remedy, and is never disappointing. About one and one-half drachms of ox-gall is dissolved in eight ounces of water. Use a tablespoon in removing the ox-gall, and allow it to remain in the water until the gall is dissolved. Solutions should be made as they are needed, as they will not keep. When oil is injected it should be followed by a soapsuds enema in about half an hour. A glycerine enema is made by mixing a tablespoonful of glycerine with the same amount of water, and is given with a piston syringe. As glycerine causes an irritation of the mucous membrane it excites peristaltic action, and a subsequent water enema will not be required.

*Purgative* enemata act by exciting peristaltic action along the entire intestinal canal. An enema consists of from one to four pints for adults, and from two to six ounces for children.

When purgative enemata act in consequence of their stimulant or irritant properties, or through absorption into the system, they are not necessarily large. They are used only when purgatives by the mouth irritate the stomach. The habitual use of enemata is to be deprecated, as they have a tendency to remove the mucus which lubricates the intestinal tract.

The following are the ones most generally in use :

(1) Aloes,  $\mathfrak{D}\text{ii}$ ;  
 Carbonate of potassa, grs. xv;  
 Barley water, half a pint.

(2) Olive oil,  $\frac{3}{4}\text{ i}$ ;  
 Sulphate of magnesia,  $\frac{7}{8}\text{ ss}$ ;  
 Senna,  $\frac{7}{8}\text{ ss}$ ;  
 Boiling water, Oi.

Infuse the senna one hour in the water, then dissolve the salt, add the oil, and mix by stirring.

(3) Turpentine,  $\frac{3}{4}\text{ ss}$ ;  
 Rochelle or Epsom salts,  $\frac{3}{4}\text{ i}$ ;  
 Warm soapsuds, Oi.

Dissolve the salt and mix the turpentine.

(4) Common salt,  $\frac{3}{4}\text{ ii}$ ;  
 Warm gruel,  $\frac{3}{4}\text{ xii}$ .

Add oil or molasses, mix and inject. This is not only laxative but nutritive.

*Gaseous* enemata are sometimes used to remove obstructions higher up in the bowel by pressure. They are given by first injecting a solution of bicarbonate of soda, followed by a solution of tartaric acid and preventing the escape of the gas from the rectum. They are to be used only under medical direction.

*Antispasmodic* enemata are used in convulsive disorders when remedies cannot be given by the mouth. They are also very effective. Hydrate of chloral is said to be more certain in its action when given by the rectum than through the stomach. In puerperal convulsions and in the epileptic *status* it has no substitute. Dissolve 30 grains in about 4 ounces of water and inject, using preferably a piston syringe of that size. Tinctures, or alcoholic preparations should not be given in an enema if avoidable. It is necessary to give a slightly larger dose by the rectum than by the mouth.

*Anthelmintic* enemata are given for the removal of thread or seat-worms. These worms have their chief abiding place in the cæcum, but cause distress when they reach the sensitive parts about the rectum. If an enema is designed to be curative, it must reach the cæcum. A strong solution of salt and water, or quassia, or cinchona and water, or a drachm of turpentine rubbed in the yolk of an egg and mixed in 8 ounces of water, should be injected from time to time until the worms are destroyed.

*Astringent* enemata are used for the relief of diarrhoea and dysentery, to arrest hæmorrhage, to cure ulceration, etc. Of mineral astringents, alum, sulphates of copper and zinc, and sugar of lead are preferred; and of vegetable astringents gallic or tannic acid are those generally used. The medicine should be well diluted, not exceeding 2 grains to 1 ounce of water. For arresting hæmorrhage copious enemata of ice-cold water are useful.

For allaying irritations of the mucous membrane of the colon, clysters of starch,<sup>1</sup> gum, flaxseed tea, etc., are useful. To this may be added 10 to 20 drops of the aqueous extract of opium.

*Nutritive* enemata are intended for the nourishment of the body, and this process is termed *rectal alimentation*. It is resorted to only when the patient is unable to swallow, or the stomach will not retain or assimilate the food.<sup>2</sup>

It is maintained that the food injected in the colon passes up into the small intestine where it is digested

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<sup>1</sup>This should be made thin enough to pass readily through the syringe.

<sup>2</sup>Well attested cases are on record where life has been sustained for months and years by rectal alimentation alone.

and absorbed.<sup>1</sup> Whatever the process may be, it is a well-known fact that undigested food placed in the colon will sustain life. Nutritive enemata should not be given oftener than once in 4 hours, and should not exceed 6 ounces in amount. It is always better to start digestion of matters injected by adding pepsin in the requisite amount.

The injection should be carried beyond the rectum (sigmoid flexure) when it is possible to do so. This may be effected when the instructions given for administering a high enema are followed. Instead of using a syringe, a funnel can be used and the liquid forced in by gravity. It is also a safe precaution to wash out the rectum with a simple warm-water clyster, removing the remainder of the old enema before giving the fresh one. The instruments should be carefully cleaned each time and then allowed to remain in some antiseptic solution.

Various kinds of food can be used, but they should be concentrated and nourishing.<sup>2</sup> Milk and eggs<sup>3</sup> are always appropriate, and strong extract of beef-tea.<sup>4</sup>

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<sup>1</sup> An Italian physician reported the fact that a man vomited a suppository which had previously been introduced into the rectum; and many other similar instances are reported.

<sup>2</sup> An excellent formula is known as "Leube's pancreatic-meat emulsion." It is prepared by taking 5 ounces of finely scraped meat chopped very fine, add  $1\frac{1}{2}$  ounces finely chopped pancreas free from fat, and 3 ounces lukewarm water. Stir this to the consistency of a thick pulp.

<sup>3</sup> Take one whole egg, 15 grains common salt, 3 ounces peptonized milk, and mix; or 3 ounces of peptonized milk and the whites of 2 eggs.

<sup>4</sup> Rennie's formula is a bowl of good beef-tea, to which is added half a pound of lean, raw beefsteak pulled into shreds. At 99° F. add 1 drachm of fresh pepsin and  $\frac{1}{2}$  drachm of diluted hydrochloric acid. Let it remain before the fire for 4 hours, stirring frequently. It is better to have it too cold than too hot. Eggs may also be added, but should be well beaten.



Pure beef juice may be given in quantities from  $\frac{1}{2}$  to  $1\frac{1}{2}$  ounces per day.

*Stimulant* enemata consist of the introduction of some form of alcoholic beverages, but alcohol is very irritating to the mucous membrane, and it should be given only when absolutely required. In shock or collapse, brandy and hot water may be administered as high up as possible. The hips may be raised by pillows to assist in passing the sigmoid flexure.

Syringes, before being put away, should be thoroughly cleansed and dried. Hang them up by one end to let the water run out, and to let the air circulate through them. If hard-rubber piston syringes leak as the result of shrinkage, allow them to soak in hot water for a time. A good syringe for medicated and nutrient enemata, is the bag syringe, which consists of a rubber bag attached to a nozzle. The nozzle should always be warmed and oiled before being inserted.

A *suppository* is a solid medicated compound, for the purpose of introducing remedies into the rectum, vagina, or urethra. Its consistency is such, that while retaining its shape at ordinary temperatures, it melts at the temperature of the body. The basis of suppositories is cocoa fat (oil of theobroma). Suppositories serve, therefore, the same purpose as enemata. Depending upon the cavity for which they are intended, their shapes are conical or cylindrical in form. Frequently they are ordered for their local effect alone, and the most common contain some preparation of opium.

To introduce a suppository it is first oiled, or slightly warmed by the hand, and introduced without force. In



giving a rectal suppository care should be taken to get it beyond the sphincter.

For laxative purposes in children, soap cut to the proper shape and molasses candy are given as suppositories. Glycerine mixed with gelatine is now made to perfection and is very useful as a laxative, the irritation by the glycerine causing peristalsis.

## CHAPTER IV.

### BANDAGES AND BANDAGING.

*Bandages* are strips of fabric used in surgery for the purpose of protecting, or compressing a part, or for holding in place dressings and applications.

They are classified as *simple*, *compound*, and *immovable*; and according to their form of application they are classed as :

- (1) *Circular*, circular turns about a part.
- (2) *Figure-of-8*, turns crossing each other like 8.
- (3) *Oblique*, making oblique turns.
- (4) *Recurrent*, returning each time to the point of starting.
- (5) *Spiral*, each turn covering part of the last.
- (6) *Spiral reverse*, reversing the bandage to make it fit closer.
- (7) *Spica*, turns arranged like the husks on an ear of corn.<sup>1</sup>

The chief points to be considered in applying a bandage are :

- (1) The purpose of the bandage.
- (2) The class of the bandage and its material.

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<sup>1</sup> *Gould's Medical Dictionary.*

(3) The part to which it is to be applied.

(4) The best method of application.<sup>1</sup>

The materials from which bandages are made are, in the order of their importance, muslin (bleached or unbleached), surgical gauze, flannel, and rubber.

A *simple* bandage is a strip of fabric from half an inch to eight inches in width and from three to twelve yards in length, evenly and tightly rolled upon itself. This is called a *roller bandage*.

A *compound* bandage consists of two or more strips, and may be either a *double roller* bandage, or consists of a number of strips fastened to each other, or a single piece partly divided (many-tailed bandage).

An *immovable* bandage is one that is combined with some material that becomes hard and immovable, such as starch, plaster-of-Paris, dextrin, silica, tripolith, etc. These are used as supports to replace splints.

In private practice a nurse can improvise bandages, by taking sheets and tearing them in strips of the proper width. To get the necessary length, the strips must be neatly joined at the ends by stitching, laying the two ends flat upon each other, and not turning the edges.

A bandage that will be wet, must be of material that will not shrink, and should therefore be made of cloth that has been washed. A bandage that is pliable can be adjusted with greater nicety than one containing a dressing. If muslin is used it should be torn and the ravellings all removed. Gauze and flannel must be cut, and care must be exercised to have it cut by the thread. A thread may be drawn out as a guide.

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<sup>1</sup> *Principles and Practice of Nursing.*—Hampton.

Bandages may be *rolled* by hand, or upon bandage rollers. In rolling by hand, fold a piece of the bandage upon itself to make a small roll and then use the palm of the hand in rolling down the thigh ; or, hold the roll in the left hand, the bandage passing between the thumb and forefinger, and exerting the necessary pressure, while the roll is turned with the right hand. Wide bandages can be rolled on round sticks about half an inch in diameter.

A bandage cut on the bias is more elastic and will permit a firmer pressure. Flannel is sometimes used in this way upon swollen parts.

The requisites for proper bandaging are :

- (1) It must be even without wrinkles.
- (2) Pressure must be exact, neither too loose, nor tight enough to check the circulation.
- (3) It must cause neither pain nor discomfort.
- (4) It must gain the object in view.<sup>1</sup>

The *width* of bandages depends upon the parts to which it is to be applied. If for the trunk or for large dressings, the bandage may be from six to eight inches in width ; for the lower extremity, from three to four inches ; for the upper extremity and head, two to three inches ; and for the fingers, one inch.

Bandaging should always be commenced at the point farthest from the trunk. The roller should be held firmly in the hand and close to the part, and should not be unwound faster than is necessary. If for any reason a part of the bandage is taken off for a better

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<sup>1</sup> The art of bandaging cannot be learned theoretically. After learning the principles of bandaging, it is only by practice that this important function of the nurse can be perfected. The tendency of beginners is to wind a bandage too tight.

adjustment, it should be rolled up before beginning again.

In completing a bandage, fold the end underneath and pin it, taking necessary care that the bandage should draw equally at both edges, and that the point of the pin is covered; or, the bandage can be split and wound in opposite directions and tied.

The *spiral* and the *figure-of-8* (Fig. 3) are the forms, in various combinations, that are generally used. A simple spiral goes round the part and at each turn overlaps the former about one-third of its width. If the part is not straight, but increases in diameter, like the forearm and leg, then reverses must be made. To reverse,



FIG. 3.—SHOWING FIGURE-OF-8 APPLIED TO FOOT, AND SPIRAL APPLIED TO LEG. To reverse, place the finger at the lower edge of the bandage to prevent its slipping (Fig. 4), and turn the bandage over, changing its direction as much as necessary to get an equal pressure and still permit a proper lapping. Reverses can be made as often as is necessary, usually at every turn on the calf of the leg. If the nurse is right-handed, the bandage should be put on from left to right. The roller should have its outer side to the part until reverses begin.

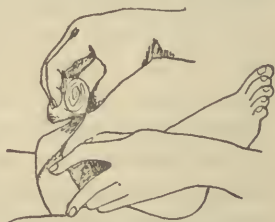


FIG. 4.—MODE OF MAKING REVERSES.

The figure-of-8 is easier of application when once perfectly learned. This is the winding alternately

above and below some point, at each turn overlapping the previous one, as in the spiral bandage. The spiral and the figure-of-8 may be used in combination (Fig. 3).

*The Head.*—For retaining dressings upon the scalp, the figure-of-8 bandage is the most useful (Fig. 5);<sup>1</sup>



FIG. 5.—SHOWING COMMENCEMENT OF CAPELLINE BANDAGE. (Cantlie).      FIG. 6.—SHOWING COMPLETION OF CAPELLINE BANDAGE. (Cantlie).

and the circular for the forehead. The transverse-recurrent (capelline) bandage is useful to cover the entire vertex (Fig. 6).<sup>2</sup> The 4-tailed bandage<sup>3</sup> of the head

<sup>1</sup> Commence above the ear and carry it forward over the eyebrows and around the back of the head as high as possible. Keep winding it round, but at each turn go higher in front and lower behind until the necessary surface is covered.

<sup>2</sup> This is a double roller. Take a roll in each hand, standing behind the patient, and begin by placing the intervening strip low down upon the forehead. Pass the rolls around the head to the occipital protuberance, where they meet. Pass the rolls, and while one continues to go round the head the other passes backwards and forwards over the vertex until the whole is covered.

<sup>3</sup> A piece of cloth 8 inches wide and long enough to pass over the head and under the chin, is torn from each end towards the middle, leaving 3 to 4 inches. The whole piece is placed upon the top of the head, the back tails are brought around and tied under the chin, and the front tails are brought around and tied at the nape of the neck.

(Fig. 7) is sometimes better where careful pressure is not required. The 6-tailed bandage is much like the former,



FIG. 7.—4-TAILED BANDAGE APPLIED TO BACK OF THE HEAD.

except that it is torn in three strips at either end, and placed sideways upon the head; the middle strips are brought under the chin and tied. The crossed bandage of the jaw<sup>1</sup> is used for retaining dressings upon

the side of the face, and in fracture of the neck or the lower jaw. The V-bandage<sup>2</sup> is useful for retaining dressings on the lips and chin.

*The Trunk.*—The circular and figure-of-8 on the neck and axilla<sup>3</sup> is used to retain dressings upon the shoulder or in the axilla.

This can be crossed on the chest or back as required. The anterior figure-of-8

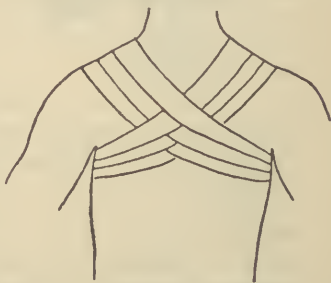


FIG. 8.—POSTERIOR FIGURE-OF-8 BANDAGE OF CHEST.

draws the shoulder forward and retains dressings on

<sup>1</sup> A roller 2 inches wide, 5 yards long, is given two turns around the head, from right to left if for the left angle of the jaw, and *vice versa*. On reaching the back of the head the second time, bring it down obliquely under the ear and jaw on the sound side and up over the affected side and around the head again. At each turn make it overlap. Terminate it by two turns around the head after reversing.

<sup>2</sup> A roller 2 inches wide, 4 yards long, is started by two turns horizontally about the head. At the second turn bring the bandage around under the ear and across the chin, lower or upper lip, whichever required, and backward over the occipital bone. Then make alternate turns over the forehead and over the face, and terminate on the occiput by pinning.

<sup>3</sup> A roller 2½ inches wide, 7 yards long, is started by two turns around the upper right arm near the shoulder, after which it is carried obliquely across the front of the chest towards the left

the chest, and the posterior draws the shoulders back. The suspensory bandage of the breast<sup>1</sup> is used to support and compress the breasts in mammary disease. It

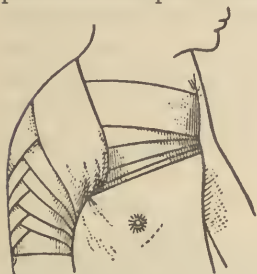


FIG. 9.—SPICA BANDAGE TO RIGHT SHOULDER.



FIG. 10.—SPICA BANDAGE TO LEFT SHOULDER.



FIG. 11.—SPICA BANDAGE TO GROIN.

requires a great deal of practice to apply this bandage successfully. The spica bandage of the shoulder (Figs. 9, 10)<sup>2</sup> is useful for retaining the shoulder in place after dislocation and for dressings. The *spiral* bandage<sup>3</sup> is

axilla, over the shoulder of the same side, back across the front of the chest, through the right axilla, over the shoulder and repeating. Protect the axillæ by cotton compresses.

<sup>1</sup> Take a roller 3 inches wide, 8 to 10 yards long, and commence by making a turn from the opposite shoulder-blade over the shoulder under the affected breast, back over the shoulder. After two turns, make alternate turns around the chest and over the shoulder, overlapping each turn until the breast is covered. Both breasts can be covered by continuing the bandage when it passes around the chest over the back and opposite shoulder, then alternating at each turn somewhat like a figure-of-8.

<sup>2</sup> A roller 3 inches wide, 10 yards long, is secured by two circular turns around the upper arm; carry the roller from the outer surface obliquely across the front of the chest, if for the right side, and across the back if for the left side, through the axilla and back to the starting place; then repeat the turns until the shoulder is covered.

<sup>3</sup> A roller 3 inches wide, 9 yards long, commencing in front of the waist and making several turns around the body. Then carry the bandage upward, overlapping at each turn about one-half of the previous one, until the axilla is reached. Then carry the roller over the back to the opposite shoulder and terminate down the front of the chest.



used to hold dressings to the chest, and as a temporary dressing, in fractures of the ribs or sternum. It must not be too tight to interfere seriously with respiration. The spica bandage of the groin (Fig. 11),<sup>1</sup> either single or double, is used to hold dressings to wounds in the groin, or to make pressure. It is frequently used for temporary retention of hernia.

*The Hand.*—The fingers usually require a simple



FIG. 12.—GAUNTLET BANDAGE.

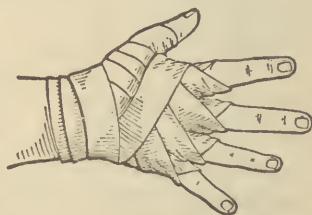


FIG. 13.—DEMI-GAUNTLET BAND-  
AGE.

spiral bandage<sup>2</sup> either for dressings or retaining splints. When all the fingers are covered it is called the gaunt-

<sup>1</sup> A roller  $2\frac{1}{2}$  inches wide, 7 yards long, is commenced in front of the thigh and given several turns around the thigh. It is then carried obliquely across the abdomen to the upper part of the pelvis, around the back, to and around the thigh to the groin. Carry it around the thigh once and then repeat, overlapping at each turn. For a double spica the roller should be 9 yards long. Proceed as for a single bandage except instead of crossing the back obliquely, cross straight to the other pelvis and come down over the abdomen to reach the opposite thigh, alternating at each turn.

<sup>2</sup> A roller 1 inch wide,  $1\frac{1}{2}$  yards long, is given several turns about the wrist and then carried across the back of the hand to the tip of the finger by oblique turns. The finger is then covered by spiral turns until the base is reached, when the roller is carried over the back of the hand and terminated by several turns at the wrist.

let bandage (Fig. 12)<sup>1</sup> and its chief use is in case of wounds and fractures. It is not used for scalds and burns as formerly, as separate dressings for the fingers are less painful and easier to replace. The demi-gauntlet (Fig. 13)<sup>2</sup> is a bandage for the palm or dorsal surface of the hand for retaining dressings when the fingers do not require bandaging. The spica bandage<sup>3</sup> for the thumb is used with splints in fractures and dislocations.

*The Arm.*—For the *wrist*, to compress the joint or to retain dressings, the circular and figure-of-8 are used. This is an easy bandage to apply. The figure-of-8 for the *elbow*<sup>4</sup> is the most useful bandage. It can also be

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<sup>1</sup> A roller 1 inch wide, 3 yards long, started at the wrist in the same way as for a single finger, but carried first to the tip of the thumb which it covers by spiral turns. It is then brought back to the wrist and given another turn and applied to the index finger in the usual way. When all the fingers are covered, the bandage is terminated by several turns around the hand and wrist.

<sup>2</sup> A roller 1 inch wide, 4 yards long, is started at the wrist by several turns and is then carried across the back of the hand through the space between the thumb and index finger. Then carry the roller back to the wrist on the palmar surface and make a turn around the wrist; then carry across the hand to the base of the next finger and repeat until the hand is covered, ending at the wrist.

<sup>3</sup> A roller 1 inch in width and 3 yards in length is started in the same way as for the fingers. It is then carried over the back of the thumb to the nail, where it is given a turn, and is then carried over the back of the hand to the wrist and given a turn. This is repeated, but coming lower on the thumb at each turn until it is covered. End with a circular turn about the wrist.

<sup>4</sup> The roller should be 2 inches wide and 4 yards long. Commence upon the forearm below the elbow, and make two circular turns while the arm is slightly flexed. Then carry obliquely across the inside of the elbow and make one turn above it. Then carry across and make a circular turn below, repeating until the elbow is covered.

used in connection with bandaging of the lower and upper arm. The spiral-reverse bandage for the arm



FIG. 14.—SPIRAL-REVERSE BANDAGE FOR THE ARM, COMPLETED.

(Fig. 14),<sup>1</sup> either for the whole arm or above or below the elbow, is the one generally used in fractures and dislocations, and to retain dressings. In making reverses they should always be in line, and made upon

the anterior aspect of the limb.

*The Foot.*—It must be determined first whether the bandage is to cover the *heel*. If so, either the *spica* (Fig. 15) or *American*<sup>2</sup> (Fig. 16) bandage is the form to use. If the heel is not to be covered, the bandage may be started above the ankle by several turns, brought down across the dorsum of the foot to the toes, and then ascending by spiral reversed turns, reversing always upon the top of the foot.

<sup>1</sup> Have a roller  $2\frac{1}{2}$  inches wide, and 7 yards long. First make two turns about the wrist. Then carry across the back of the hand, and make a circular turn at the second joints of the fingers and ascend the hand by several turns as far as the thumb. Cover the base of the thumb and the wrist by several figure-of-8 turns. Then carry the bandage up the forearm by spiral-reversed turns, making the reverse upon the front of the arm, until the elbow is reached. The elbow can then be covered by figure-of-8, as in the preceding bandage. If it is desirable to continue the bandage up the arm, it should be 10 yards in length.

<sup>2</sup> The roller should be  $2\frac{1}{2}$  inches wide and 7 yards long. Make two circular turns above the ankle. Carry obliquely across the top of the foot to the joint of the great toe, then make spiral or spiral-reversed turns, ascending the foot to above the instep, and carry the roller over the point of the heel and back to the top (dorsum) of the foot; thence beneath the instep to one side of the heel, up over the instep to the other side of the heel, thence up in front of ankle continuing up the leg.

*The Leg and Thigh.*—The bandages to be selected for the lower extremity are in form about the same as for the upper, but in size should be about half an inch wider and correspondingly longer. For the *knee* the



FIG. 15.—SPICA BANDAGE OF FOOT.



FIG. 16.—MODIFIED FIGURE-OF-8 BANDAGE OF LOWER EXTREMITY.

figure-of-8 is the best adapted, and should be applied as for the elbow, commencing the bandage above the knee. Sometimes it is necessary to bandage both knees together.<sup>1</sup>

<sup>1</sup> Select a roller  $2\frac{1}{2}$  inches wide and 7 yards long. Place the knees together with a compress between them. Then start by making two turns upon the thigh several inches above the knee, and carry the roller across the back of both knees to the leg of the opposite side, making a circular turn about both legs below the knees. Carry the bandage on the second turn above the knees to cross the other, and repeat, gradually ascending from below, and descending from above until the knees are covered. Finish by carrying the bandage snugly up and down between the legs.

Stumps, after amputation, require bandaging, the best form to use being the recurrent.<sup>1</sup>

The bandage of *Scultetus* (Fig. 17) is a compound bandage consisting of a number of pieces 2 to 3 inches

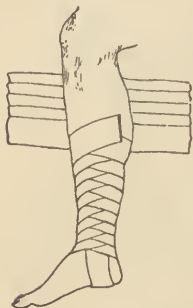


FIG. 17. — BANDAGE  
OF SCULTETUS.

wide and long enough to go one and one-third times about the part. They are put under the part so that one piece will overlap and secure the other. The last piece is secured by pins. This bandage possesses the advantage that single soiled strips can be renewed without changing the whole bandage. It is also useful in operations, such as excisions, where the parts should not be disturbed. If a thread is passed through each strip in the centre, it is known as *Pott's* bandage.

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<sup>1</sup> A roller  $2\frac{1}{2}$  inches in width, 5 to 7 yards in length. Start a few inches above the stump, and carry the bandage over the end of it and upward on the opposite side of limb, return to the point of starting in the same manner, and continue until the stump is sufficiently covered. Then reverse and secure the bandage by several circular turns.

## CHAPTER V.

### BANDAGING (*Continued*) ; SPLINTS.

SQUARE pieces of muslin or handkerchiefs are used for the temporary dressing of wounds and fractures. A handkerchief may be modified to produce many ingenious bandages.

The forms in which the handkerchief can be used are the *square*, *oblong*, and *triangle*. The *cravat* is made from the triangle by folding the handkerchief upon itself lengthwise. The axillary cravat (Fig 17A) is useful to hold dressings in the axilla.



FIG. 17A.—AXILLARY  
CRAVAT.

*Barton's* handkerchief is employed to make extension in case of fracture of the leg or thigh. A handkerchief is folded into a narrow cravat and placed

around the heel over the foot, thence around the instep.

*Rubber bandages* are made from strips of rubber sheeting, from 1 to 4 inches in width and from 3 to 6 yards in length. This is made into a roller.

They are chiefly used where it is desirable to have a

very elastic pressure over the part, such as in varicose veins of the leg and in chronic ulcers where strapping is indicated.

The rubber rollers are applied in the same manner as indicated for muslin rollers, except that the rubber, on account of its elasticity, need not be reversed. Care must be taken not to stretch the bandage too tightly. The bandage is terminated by two tapes sewed to the extremity, which are passed around the part and tied.

Rubber bandages cannot be worn continuously, as they do not allow evaporation of the skin secretions. They should be taken off at night and hung up to dry.

*Immovable* bandages, fixed dressings, or hardened bandages are made from a variety of substances, which are incorporated in or upon fabric to stiffen it.

Plaster-of-Paris is more commonly used. It should be extra-calcined ; if moist or of inferior quality it will not set rapidly or firmly.

There are several ways of applying this dressing, but the most convenient method is Sayre's,<sup>1</sup> which is the use of bandages which have been saturated with the plaster and moistened while being applied. Another way is to first apply neatly to the part a flannel or muslin bandage that will not shrink ; over this is placed a layer of cheese cloth or other loose material. Some plaster-of-Paris is then mixed with water to the consistency of cream and painted or plastered over the

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<sup>1</sup>The material used is some loose fabric such as cheese-cloth or netting or crinoline, which is cut into strips from 2 to 3 inches in width. These are laid flat and plaster-of-Paris is dusted over them and rubbed in. The strips are then loosely rolled up. They must be kept in sealed jars, or they will become moist and unfit to use.



whole surface. Another layer of the loose material is put over this and the plaster is applied again, and thus repeated until the proper thickness is gained. Care should be taken that all bony prominences are protected by pads of cotton.

Sometimes strips of tin, zinc, or pasteboard are put in the layer of the bandage to increase the stiffness.

The *interrupted* plaster dressing is used where a portion of the limb is to be exposed. An iron rod can be placed across such parts with its extremities connected to wire. The wire can then be incorporated in the bandages and covered with plaster.

The *starch* bandages are made by the application of starch mucilage,<sup>1</sup> either with a brush or by hand, over the outer surface of the bandage as it is applied to the limb. Pieces of pasteboard soaked in starch are placed between the layers of bandage. This bandage dries very slowly, requiring from twenty-four to forty-eight hours before it becomes firm.

Besides the materials described, gum and chalk, silicate, paraffine, and glue are used for fixed dressings, but they do not possess any advantages over starch and plaster-of-Paris.



FIG. 18.—SHOWING A TRAP  
IN A PLASTER-OF-PARIS  
DRESSING.

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<sup>1</sup> Starch mucilage is made by mixing starch with cold water to make it the consistency of cream; then as the mixture is stirred boiling water is gradually added to it until it becomes a clear, thickish mucilage.



Sometimes, as in compound fractures, there are surfaces that must be left exposed, and there must be an opening made in the bandage. This is termed *trapping* (Fig. 18). To accomplish this, before applying the bandage a compress of lint is placed over the wound, and this marks the place where the bandage is completed. The projection can be cut around after the bandage is partially hard.

For removing plaster-of-Paris from the hands, put a



FIG. 19.—ARM SLING, including elbow.



FIG. 20.—SLING TO SUPPORT THE UPPER ARM.

tablespoonful of carbonate of sodium in a basin of water.

*Adhesive plaster* is occasionally used for the support of a limb in place of the bandage. The plaster should be cut lengthwise of the roll. For strapping the extremities, the strips should be an inch and a half wide and sufficiently long to lap a few inches. The plaster is warmed by holding the white side over a flame, or applying it to any warm surface. The hair should be shaved off before applying. Adhesive strips are used in preference to bandages in the case of fractured ribs.

*Slings* are made from handkerchiefs, square pieces

of muslin, and rollers, and are used to support the limbs in fractures or wounds. A sling for the arm may include the elbow or not (Fig. 19). It usually does when pressure is to be exerted on the shoulder. If the upper arm is to be supported, the slings should support the wrist only (Fig. 20).

*Splints* are used to retain bones in position after fracture until union occurs. They may be of wood, tin, lead, copper, gutta-percha, pasteboard, or sole leather.

*Wood* makes the simplest and best splint, either white pine or basswood, giving sufficient strength and



FIG. 21.—EXTENSION SPLINT FOR THIGH (*Cantlie*).

at the same time being light. They are usually made from boards half an inch in thickness, planed down, and with rounded edges. Before being applied they should be well padded with cotton, wool, oakum, or hair, and in some cases bags filled with bran are used between the limb and the splint.

*Pasteboard*, or binder's board, is first soaked in boiling water, after being cut to the proper size, and when soft is padded with a layer of cotton and secured by a bandage. When it dries it becomes hard and retains its shape.

*Gutta-percha* made from sheets from  $\frac{1}{16}$  to  $\frac{1}{4}$  inch in

thickness becomes soft when soaked in boiling water, and adapts itself to the shape of the part. Care must be taken not to let it become too soft.

*Sole leather* is treated in the same way, and makes an excellent splint.

The immovable dressings act as splints and obviate the necessity of any other material.

In fractures of the lower extremity the *fracture-box* is a splint generally used, and consists of a piece of

board 18 to 20 inches long, with a foot-board secured at one end. To the sides of the board are attached boards with hinges.

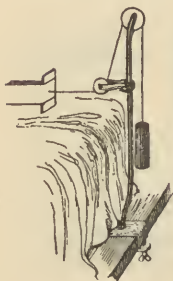


FIG. 22—EXTENSION APPARATUS AT FOOT OF THE BED.

The *extension* splint is a long board reaching from below the foot nearly to the axilla (Fig. 21). It is arranged to stretch the limb (extension) in fractures and avoid shortening, as well as to retain the fractured bones in position. Extension is also afforded by attaching a weight to the foot by a cord that hangs over the foot of the bed (Fig. 22).

## CHAPTER VI.

### FRACTURES, DISLOCATIONS, AND SPRAINS.

A *fracture* is the breaking of a bone either by some force from the outside or by muscular action.

Fractures are *classified* as *complete*, *incomplete*, *simple*, *compound*, *comminuted*, and *impacted*.

A *complete* fracture is one in which the bone is completely broken across.

An *incomplete* fracture is one in which the bone is broken a part way across, the remaining part of the bone bending instead of breaking. This is also known as "greenstick" fracture (see vol. i., p. 4).

In a *simple* fracture there are but two fragments and the external skin is not ruptured.

In a *compound* fracture there is an open wound exposing the seat of the fracture to the air.

*Comminuted* fractures are those in which the bone is broken into more than two pieces.

In an *impacted* fracture one fragment is driven into the other and becomes fixed.

The *direction* of the fracture may be *transverse*, that is, when the bone is broken directly across ; or *oblique*, when the line of fracture is diagonally across the bone ; or *longitudinal*, when the line of fracture is lengthwise of the bone.

Fractures are the most common injuries of bones, and in the majority of cases in which an accident is followed by some deformity of the body, fracture exists. In addition to the deformity, the usual signs of a fracture are pain, disability, feeling the displaced fragments of bone, a grating sensation caused by rubbing of the broken ends together, called *crepitus*, and swelling and discoloration. All of these symptoms may not exist. Sometimes a bone is fractured in which there is no marked displacement, and the deformity is slight. There is nearly always pain and inability of the patient to move.

In case of a suspected fracture the patient should be placed in as comfortable a position as possible until medical aid arrives. In the meantime, however, the clothing covering the part can be removed, and this should be gently done, ripping up the seams rather than moving the patient. Any movement of the injured part while the ends of the bone are not in apposition, has a tendency to tear the soft tissues, and may rupture a blood-vessel. In lifting a person with a fracture, the injured part should rest upon the hands in such a manner as to relieve any strain at the point of fracture.

Where medical aid is not available, the nurse should compare the two limbs to ascertain the degree of deformity. By very careful extension the bones may be brought into apposition and give the patient great relief. If the fracture is compound, the wound must be cleansed with the greatest care and thoroughness, and there must without any doubt be entire cleanliness of the ruptured tissues before they are restored to position. A solution of carbolic acid, 1 to 40, or some other in-

nocuous (non-poisonous) disinfectant should be used to irrigate the parts thoroughly. All loose fragments of bone must be removed, and in case of hæmorrhage it must be controlled either by securing the broken vessel or by tourniquet.

*Provisional* care of a fracture awaiting medical aid, should consist of support, especially if muscular spasm has a tendency to displace the broken fragments. Sometimes, also, fractures occur at localities where treatment cannot be properly conducted, and for transportation of the patient some provisional arrangement is required. In fractures of the upper extremity or shoulder, the arm can be bound to the side by some article of clothing, but in fractures of the lower extremity the parts should be surrounded by a binder made of any fabric at hand, and there should be applied to the side of the limb strips of wood, shingles, strips of bark, or any material of the proper stiffness (Fig. 23). Umbrellas, broomsticks, or canes can be used for the purpose. The parts must be arranged in some manner so they will not move about.



FIG. 23.—PROVISIONAL DRESSING FOR FRACTURE.

The *nasal* bones are frequently fractured by direct blows or falls, and these fractures are sometimes followed by profuse hæmorrhages, which may require plugging of the nares to control.

The *lower jaw* is sometimes fractured and results in great deformity. A satisfactory temporary dressing is

the 4-tailed bandage. During treatment the mouth becomes very offensive, and the nurse must make frequent applications of solutions of boric acid or other aseptic mouth wash.

Fractures of the *ribs* are more frequent than any other bones of the trunk. The most common seat of the fracture is near the angle of the rib. These fractures are usually dressed by enveloping the injured side of the chest with strips of adhesive plaster,  $2\frac{1}{2}$  inches in width and long enough to extend from the spine to the middle of the chest. Provisional dressing is afforded by a strong binder of stout muslin.

The *pelvis* is sometimes fractured, but this injury is apt to be complicated by serious injury of the abdominal organs. Temporary care of these fractures requires flexing of the thigh and supporting of the legs upon pillows.

The *vertebræ* are sometimes fractured, and this injury is a very serious one, on account of the liability of injury to the spinal cord. Where a fracture of the spine is suspected, the greatest care must be exercised in moving the patient. A water-bed is desirable, and great care must be taken to keep the patient clean, —especially the parts exposed to pressure.

Fractures of the *skull*, in which depression of bone occurs, are usually accompanied with cerebral symptoms. The outer table of the skull may be crushed, making a marked depression, without breaking of the inner table. This is not serious.

The *clavicle* is frequently fractured, and it may be complete or incomplete. The deformity may be reduced by placing the patient upon his back with the head slightly raised, and bringing the arm to the side of



the chest. A good temporary dressing is the 4-tailed bandage.<sup>1</sup>

The *scapula* may be fractured in any of its parts. Temporary dressings may be made by putting a folded towel in the axilla and binding the arm to the chest by a roller in spiral turns around the chest, supporting the forearm in a sling.

Fractures of the *arm* should be dressed temporarily in any way to reduce the deformity and to give the patient the greatest ease. An extemporized splint is required for support, tied firmly with handkerchiefs or strips of muslin (Fig. 24).

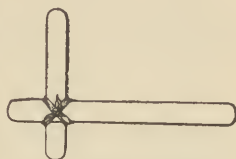


FIG. 24.—EXTEMPORIZED ANGULAR SPLINT FOR ARM.

Fracture of the lower end of the radius is a very common fracture, caused by falling upon the hand. It is usually accompanied with dislocation of the ulna, and is called *Colles's* fracture. The deformity is a peculiar drop of the wrist known as the goose-neck deformity. Provisional care of this fracture is best given by a narrow sling for the wrist, with the hand resting upon the ulnar side. Fractures of the bones of the hands are best cared for temporarily by placing a roller 1½ inches thick in the hand; and winding a bandage loosely above it.

A fracture of the neck of the *femur* is very common

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<sup>1</sup> Take a piece of muslin 2 yards long, 14 inches wide. Cut a hole in the centre about 4 inches from the margin, to receive the elbow. Then split the bandage into 4 tails in the line of the hole and within 6 inches of it. Place a folded towel in the axilla, the elbow in the hole, and carry the lower tails across the chest and back and tie about the neck on the opposite side. Carry the remaining tails around the chest and tie.—*Wharton*.



in old people after a fall. In addition to pain, the foot is thrown outwards, and there is some shortening of the leg, without other deformity. This fracture is usually treated by *extension* (Figs. 21, 22), but in persons over seventy years of age, rest in bed is the only treatment required.

In all fractures of the lower extremity extension is employed, unless the fracture is transverse. Frequently immovable bandages are employed.

*Pott's* fracture is a fracture of the fibula near the ankle, and is very common, resulting from a wrench or severe muscular action. It is frequently mistaken for a sprained ankle. It can be recognized by the foot turning outwards. In the care of fractures, the nurse must attend particularly to all parts subjected to pressure. Any unusual redness indicates irritation, and the part should be temporarily relieved from pressure and bathed with diluted alcohol.

A *dislocation* (out of joint) is the displacement of the bones forming a joint. It may be *simple*, or *complete*, or *complicated*; it may also be *old* or *recent*.

A *simple* dislocation is one in which the bones are displaced without any injury to the surrounding tissues.

It is *complete* when the bones are entirely separated from each other.

A *compound* dislocation is one in which the skin is ruptured and the air communicates with the joint, as in compound fracture.

In a *complicated* dislocation, in addition to the displacement of the bones, there is a fracture, or a wound of the vessels, nerves, or muscles.

A *recent* dislocation is one in which inflammatory

changes have not had sufficient time to seriously interfere with the reduction of the joint, and *vice versa* an *old* dislocation is one that has existed for some time and in which *adhesions* do not allow an easy reduction.

A dislocated joint always presents a deformed appearance, and the bone that is out of joint will cause a projection or swelling. These injuries are usually very painful, and they are frequently very difficult to reduce. A nurse can do but little, much less than with a fracture, to make the patient comfortable. The part can be supported and cold applications can be applied to keep the swelling down, but little else can be done in the absence of the physician. Some dislocations may be easily reduced and may be attempted by the nurse, such as the following, viz.:

The *lower jaw* may have either one or both condyles thrown out of place. This dislocation is very evident from the deformity produced and it cannot be mistaken.<sup>1</sup>

The *clavicle* may be put out of joint at either end ; if at the shoulder end, there is a well-marked lump at the top of the shoulder, and the shoulder is flattened.<sup>2</sup> The reduction of the sternal end of the clavicle is not easy and should not be attempted by the nurse.

The *humerus* may be thrown out of joint downward, forward, or backward. It is best reduced by a series

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<sup>1</sup>To reduce, protect the thumbs with a handkerchief wrapped about them ; place them over the lower molar teeth and press the angles of the jaw downward while elevating the chin with the fingers. The jaw should be fixed for a week with a 4-tailed bandage.

<sup>2</sup>To reduce, place the knee against the spine and draw the shoulders backward, pressing the displaced clavicle into place. The reduction is generally easy, but if it does not return after a short trial await the arrival of the physician.

of movements that cause the muscles to act in throwing the head of the bone into position, but it can also be reduced by extension—placing the heel of the operator in the axilla and pulling the arm downward.

Dislocation of the *elbow* backward can be reduced by placing the bend of the elbow over the knee and making pressure.

Other dislocations of the arm require complicated manipulation. Dislocation of the *fingers* can usually be reduced by extension.

Displacement of the bones of the lower extremity are more complicated than those of the upper and the dislocations are more frequently compound. In these grave injuries, operative measures are often required. The same precautions to avoid infection are necessary as in compound fractures.

The subsequent treatment of dislocations is frequently as prolonged as in case of a fracture, and the same general rules apply. A joint that has been dislocated must not be left in one position too long, for fear of ankylosis.<sup>1</sup> This is more to be feared where the violence has been great. Careful passive movements of the joint are necessary, at least once daily, after the first week, to prevent adhesions and permanent stiffness.

A *sprain* is the stretching or laceration of ligaments about joints. It may be caused by a twist or a blow either direct or indirect. The symptoms are severe pain, disability of the joint, and severe swelling, with discoloration from effusion of blood. For sprains that are not severe, hot applications, entire rest, and a firmly

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<sup>1</sup> Union of bones forming a joint, creating a stiff joint.

applied bandage are sufficient. A lotion of lead-water and laudanum reduces swelling and pain to some extent. Sometimes a plaster-of-Paris bandage is useful to give support to the joint, but this should not be applied if the swelling is great. In sprains of the larger joints no attempt to use the limb should be made under a week. Afterwards the patient should be encouraged to use the joint, or passive movements should be practised to prevent stiffness. In old sprains no treatment is as effectual as well-applied massage.

## CHAPTER VII.

### FEVER ; INFLAMMATION.

*Fever* (from the Latin *febris*, and this from *fervere*, "to be hot") is an elevation of the body temperature beyond the limits of health. In order that an elevation of temperature may be considered as fever, it must continue for several hours, and not be the result of excessive external heat or muscular exercise.

Fever is classed as *continuous*, *remittent*, and *intermittent*.

In *continuous* fever the range is constant and remains steadily above the normal line with but slight changes.

A *remittent* fever is characterized by distinct paroxysms, in which the temperature rises and falls, but does not reach the healthy standard.

In *intermittent* fever the temperature reaches a high point, and then falls to the normal, or below it. These changes usually occur periodically.

There are usually *three stages* of fever, known as the *invasion*, the *fastigium*, and the *decline* or *defervescence*. The first of these is usually preceded by a period called "*the incubation*," during which the poison in the system works to produce its particular symptoms. These stages may vary in duration from a few hours to a week or more. The temperature, as shown by the ther-

mometer, determines the character and duration of the several stages.

A fever may decline in two ways, either by *crisis* or *lysis*. If it drops rapidly to normal, as is usual in pneumonia, it is called *crisis*. If the decline is very gradual, becoming less and less each day, as in typhoid fever, it terminates by *lysis*.

Fever is usually *caused* by the entrance into the body of disease germs, or micro-organisms, and the condition produced by them. A fever of purely nervous origin has been described, but it is rare. Even in injuries the existence of fever is proof that suppuration is going on in the wound. In modern surgery, where operations are carefully performed under aseptic precautions, it is the exception to have an elevation of temperature that can be called a fever.

Fever *heat* is *produced* by the increased oxidation, or consumption, of the blood and tissue elements. This is shown in the increase of waste products in the bodily excretions and exhalations.<sup>1</sup>

As previously stated, the temperature of the body changes about one degree in the course of twenty-four hours, the average being 98.6° F.<sup>2</sup> ; the highest temperature in health occurring about 4 P. M., and the lowest between midnight and morning. The range of temperature in health, therefore, may be between 97.4°

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<sup>1</sup> The amount of carbonic acid in the expired air is markedly increased, in fever, particularly in the stage of invasion. Also the quantity of urea is increased.

<sup>2</sup> Fractions of a degree should always be expressed in tenths ; then the necessity of using a denominator is avoided, and the decimal point expresses the value. Some thermometers have the degrees divided in fourths, but they are usually divided in fifths ; each mark then indicates .2.

and  $99.6^{\circ}$ . But if a morning temperature recorded  $99.6^{\circ}$ , it would be considered abnormal, while the same temperature in the afternoon would not be. The daily drop in the temperature occurs in the morning.

In disease the temperature may rise to  $107.6^{\circ}$ , and may fall as low as  $95^{\circ}$ . This range is considered within the limits compatible with life. The height of the thermometric record is the measure of the height of the fever, and the height of the fever corresponds usually to the intensity of the disease. A high temperature lasting but a short time does not always indicate danger. It is the high fever maintained for days that gives evidence of the severity of the disease.

A *subnormal* temperature, or one below the standard of health, indicates depression of the vital forces. Thus in severe hæmorrhages, in shock produced by injury, in chronic wasting diseases, in certain forms of paralysis, a subnormal temperature may exist. Especially in states of collapse, when there is almost a suspension of the vital forces, the drop in temperature becomes extreme, reaching sometimes as low as  $95^{\circ}$ . Should it go below this point there is no hope of recovery.

The record made by the thermometer depends upon where the temperature is taken. It is usual to allow a difference of .6 (six-tenths) of a degree between the temperature taken in the axilla and that under the tongue, the latter being the higher; and the temperature taken in the rectum is about as much higher than that taken in the mouth. It is important, therefore, that the nurse should take the temperature continuously in one place, for purposes of comparison; or, if a change is necessary, it should be plainly stated upon the clinical record.



A *chill*, or *rigor*, which is often the first indication of an oncoming disease, is produced by a very rapid rise in temperature. There is a spasmodic contraction of the capillaries on the surface of the body. The patient feels dull and shivers, and sometimes shakes violently. This feeling is increased upon moving, or upon exposing the body to the air. If the temperature is taken at this time, it will be found to be higher than normal.

In children, the onset of a fever is frequently characterized by a convulsion—one or more, the spasm taking the place of the chill in the adult.

After the chill, which lasts from a few minutes to an hour or more, there is a period of dry, burning heat (the hot stage), and this may be followed by a slight or copious perspiration which relieves the burning sensation in a degree. The temperature will probably be found to continually rise during this period.

Should the fever rise slowly there is no chill, but a gradually increasing feeling of heat, and a feeling of tiredness and soreness of the body. There is usually thirst, anorexia (loss of appetite), at times vomiting, increased pulse and respiration, with the other symptoms noted above. The tongue is usually more or less heavily furred, and the bowels constipated. Much depends upon the nature of the disease to which the fever belongs.

At the close of the stage of invasion, there are usually special symptoms which indicate the nature and class of the disease.

The nurse may cover patients in a chill, and cool the room during the stage of heat, but moderately in both cases. A cold compress may be applied to the head without injury. After a period of severe sweat-



ing, the patient's linen should be changed after the room is properly warmed, the skin dried during the change, and where possible the patient should be removed to another bed.

*Thirst* is always an accompaniment of fever, particularly in the stage of invasion. From the increased difficulty of breathing, and the dried mouth, patients usually lie with the mouth open. As a rule, the use of cold water is admissible.

In *fatal* cases the temperature frequently rises several degrees shortly before death. As the result of shock, however, as in the perforation of the bowel in typhoid fever, the temperature falls abruptly to or below normal, the decline being accompanied by great restlessness, a cold sweat, and sometimes by delirium or coma. Death may occur at any stage of a fever from blood-poisoning, or later from the effects of high temperature.

It is now generally believed that fever is a means by which nature endeavors to destroy disease germs. It has been demonstrated that the tubercle bacillus does not grow at a temperature above  $105.8^{\circ}$ , and this applies to some other diseases.

The danger in fever is usually indicated by the changes of temperature ; thus, it is unfavorable when the evening temperature is high and the morning drop is slight. In other words, a high morning temperature is more unfavorable than a high evening temperature. A temperature above  $104^{\circ}$  F. is unfavorable. A decline of fever without a corresponding fall in the pulse-rate does not indicate improvement. A rapid rise, especially in the later stages of the fever, indicates danger, chiefly from complication or relapse. A rapid and decided decline, unless at the time for a crisis, is frequently the

indication of a collapse. The nurse should understand indications so that any important change may at once be reported to the physician.

The temperature may often be fairly gauged by the feel of the skin to a skilful nurse. A nurse should endeavor to educate the hands to distinguish changes in temperature in this way. This will often suffice between the periods of using the thermometer, to ascertain any change. But it must also be remembered that the skin is not always a reliable index of the body temperature.

The principal *treatment* to reduce a fever, at the present day, is the application of water to the body (hydrotherapy). This includes both the internal and external administration of water. (The use of Baths will be treated in a separate chapter.)

*Inflammation* is the movement of blood to a part of the body, in great excess, causing *redness, swelling, heat, and pain*. In a part open to inspection affected by inflammation these four signs always exist.

Inflammation of the internal organs is chiefly detected by pain increased by pressure or motion, and general vascular excitement causing more or less fever.

When more blood goes to one part of the body than is needed, or than there is in corresponding parts, it is *hyperæmia*, or *congestion*. When the blood-vessels are distended, the elements of the blood do not exchange in the tissues, and the capillaries are dammed up. This is called *stasis*. There is more fibrin than the tissues can take up and it is deposited in the tissues, and this is called *plastic lymph*, or *exudation*. Inflammation is well illustrated by the application of a mustard plaster to the skin. Its first effect is stimulating. It

warms and reddens the skin ; if allowed to remain, the skin grows warmer and redder and some pain is produced. This is the stage of *irritation*. Now, if the mustard is withdrawn, these symptoms will all subside, but if not, then the irritation increases and inflammation occurs. There is redness, swelling, heat, and pain, and subsequently exudation (in the blister that is raised). If the exudation is reabsorbed after the swelling and redness subside, it is called *resolution*. When arterial blood is obstructed, there is exudation of lymph ; and when venous blood is obstructed, the exudate is *serum*. When inflammation does not terminate by resolution, the exudate degenerates into *pus*, and this is called *suppuration*. The simplest example of this is an ordinary vesicle of the skin. There is a point of swelling,—red, painful, and hot. The swelling is caused by the exudate. It may pass away, “dry up” (reabsorbed) ; or it may go on to degeneration and pus is formed, and we call it a boil. When the pus gathers at one spot, we say the boil has pointed.

## CHAPTER VIII.

### HÆMORRHAGE.

*Hæmorrhage* is the escape of blood from a wounded or ruptured blood-vessel.

It may be *arterial*, *venous*, or *capillary*; and is further classified as :

(1) *Primary*, that is hæmorrhage which occurs at the time the wound is made ;

(2) *Intermediary*, when occurring at the time of reaction, or about 24 hours after the injury ; and

(3) *Secondary*, bleeding which occurs after 48 hours, or at any time subsequent to this period until the wound is healed.

*Arterial* hæmorrhage may be distinguished by the bright crimson color of the blood, by its spurting out in jets with a pulsation and with considerable force, and by the bleeding occurring from the side of the wound nearest the heart.

*Venous* bleeding is marked by the sluggishness of the flow, the dark or purple color of the blood, an absence of pulsation, and the greater bleeding from the part of the wound farthest from the heart.

*Capillary* hæmorrhage is the oozing of blood, and occurs when the skin is cut. The blood is red in color, comes in a brisk, free stream, with a continuous flow, and comes from all parts of the cut surface.

Hæmorrhage may be from all three sources at once. It may also be *active*, *passive*, *traumatic*, *symptomatic*, *critical*, and *vicarious*.

*Active* hæmorrhages are those in which the determination of blood to the part precedes the bleeding ; *passive*, those in which the coats of the vessels are inefficient and congestion forces the blood through them.

*Traumatic* hæmorrhages are those produced by wounds ; *symptomatic*, those occurring during the course of a disease, as bleeding from the nose in typhoid fever, bleeding from the lungs in pulmonary consumption, etc. ; *critical*, the occasional termination of serious diseases, such as yellow fever, etc. ; *vicarious*, that which substitutes a physiological hæmorrhage, such as spitting of blood on suspension of the menses, bleeding of the nose on arrest of bleeding from piles, etc.

The extent of the hæmorrhage depends upon the size of the injured vessel, the manner in which it is cut, and the state of the circulation at the time. An artery cut across will bleed more severely than one cut the length of the vessel ; an incised (sharp cut) wound more than a lacerated (crushed) wound, and a puncture more than an artery completely severed.

Hæmorrhage usually occurs unexpectedly, and may therefore be classed as an emergency. For this reason the nurse must be fully prepared to combat, or at least should have a knowledge of the various means for controlling it.

The constitutional symptoms of hæmorrhage, when it is severe, should be carefully watched for, as they indicate the degree of danger. The pulse gives a certain indication of the heart's condition, the lips have a

“bloodless” appearance, and the countenance is anxious. Usually the pupils are dilated and the patient is restless; the extremities are cold; the respirations are shallow; there is more or less vertigo, and the patient has difficulty in speaking. These symptoms increase in intensity to unconsciousness and collapse. Fainting has a tendency to arrest bleeding, and is therefore desirable. When the hæmorrhage is internal, the symptoms given above are a pretty sure index of its rate and continuance.

There are no occasions more disconcerting or appalling than a sudden, unexpected hæmorrhage, and none which call for more coolness and self-control on the part of the nurse. She should always carefully analyze the symptoms and ascertain the character and source of the bleeding, and not act impulsively, but with reason.

Hæmorrhage may be arrested by natural or artificial means. By *natural* process it is controlled :

(1) By coagulation; the clotted blood forming a plug, which dams the flow from the vessel.

(2) By a reduction of the heart's force, as in fainting.

By *artificial* means as follows :

(1) By pressure on the vessel either at point of injury or behind it, to shut off the flow.

(2) By *elevation* of the parts.

(3) *Tying* (ligature) of the injured vessel.

(4) Application of *heat* or *cold*, and of remedies that coagulate the blood.

(5) By *twisting* or *torsion* of the vessel.

When pressure is made upon an artery to stop bleeding, it should be above the wound, or between it and the heart. Temporary pressure may be made with the

fingers upon the ruptured end of the bleeding vessel or



FIG. 25.—GRADUATED COMPRESS.

above it, in the arteries near the surface. A graduated pad (Fig. 25) can be bound with a

roller over the artery as near the wound as possible, and if this is too deep to be reached, then over the main trunk supplying it.

A *tourniquet* is an instrument to compress the blood-vessels to control hæmorrhage. It consists of two metallic plates with a thumb-screw and a strap (Fig.

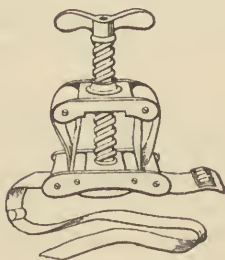


FIG. 26.—PETTIT'S  
TOURNIQUET.



FIG. 27.—A TOURNIQUET  
MADE FROM A HAND-  
KERCHIEF AND A  
STICK.

26). A pad is placed over the vessel under the strap which surrounds the limb, and the strap is then tightened up by the thumb-screw. An improvised tourniquet can be made with a handkerchief twisted around a limb or any stick, with any hard substance over the site of the vessel (Fig. 27). Bear in mind



that what is needed is a strap, a pad, and a means of tightening it.

*Acupressure* was formerly much employed. It consists of thrusting a long pin through the skin and beneath the vessel, thus making pressure upon it.

The most certain means of permanently arresting hæmorrhage is by tying the severed end of the vessel by *ligature*. In operations this is the usual procedure, but in accidental injuries, the time required and the difficulty of finding the vessel require a readier method. The contractile nature of arteries causes them to shrink when divided, and they are drawn in from the surface of the wound. By using a sharp tooth forceps and following the jet of blood, the artery can usually be seized. The best ligatures are properly prepared sterilized catgut or silk. The materials to be prepared for the surgeon are ligatures, sponges, forceps, scissors, rollers, lint for compresses, etc.

*Styptics* are remedies that cause the contraction of blood-vessels and check bleeding by reducing the size of the apertures, and also assist in coagulating the blood and thus plugging the vessel completely. The best styptic is cold, but, aside from cold and heat, *Monsel's* solution of *iron* is effective. It can be applied with a brush or a pledget of cotton. Among other styptics, perchloride and subsulphate of iron, alum, tannic acid, vinegar, and common salt are well known but not always reliable.

*Cold* is the oldest and best known styptic. Exposure to the air alone, after removing all clots, frequently stops troublesome bleeding from wounds that bleed continuously in a slow oozing manner. Fanning the wound sometimes has a good effect.



Compresses dipped in ice-water, and ice itself either applied directly to the wound, or indirectly in bladders or rubber bags, may be tried.

*Heat* is of no value unless it is as great as can be borne. Hot water at a temperature of about 125° F. to 130° F., which is the greatest heat bearable by the back of the hand, allowed to run in a stream upon the wound, has the advantage of being styptic and at the same time stimulating, while cold is depressing.

The actual cautery<sup>1</sup> is the most powerful and certain of all styptics. This leaves a charred surface which is antiseptic, and when this surface comes off it leaves a healthy granulating wound. It is used chiefly after operations and seldom in emergencies.

*Torsion* is the twisting of the end of a divided vessel by a forceps. This is applicable only to the smaller arteries, but is very reliable.

The force of the blood sent to a part is much influenced by gravity, hence, elevation of the injured part is helpful in the arrest of bleeding. This is always within the power of the nurse to do. Rest is also an aid. Get the patient into the proper position and insist upon quiet.

By *flexion* and pads behind joints bleeding can often be very well controlled (Fig. 28). This is also a simple procedure easily improvised.

The constitutional treatment after immediate danger is past, is very important. Patients cannot be stimulated freely on account of the danger of recurrence of the hæmorrhage, yet exhaustion is sometimes very great. In anæmia, when the blood is of poor quality,

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<sup>1</sup>The actual cautery is a wire or a piece of iron brought to a white heat.

it does not coagulate readily, and the loss is doubly felt by the patient, while the danger of the bleeding recurring is greater than usual. Stimulation should be with small and repeated doses of wine, and the diet should be dry and light.

*Venous* hæmorrhages sometimes result from a blow or strain, or in reducing a dislocation. If a large vein is ruptured, a dangerous loss of blood may ensue. There is a possibility of air gaining an entrance into a broken vein. An elevated position with compresses and bandages will stop bleeding from superficial veins.

*Capillary* hæmorrhage is never of much importance except in the case of "bleeders." It can nearly always be checked by styptics, preferably cold.

After operations, and particularly amputations where several large arteries have been divided, careful observation is necessary for the first forty-eight hours. If the dressings become deeply stained, the surgeon should be informed. The pulse responds to hæmorrhage readily and is a guide for the nurse. Awaiting the arrival of the doctor in case of consecutive hæmorrhage, the nurse should use the means at hand for its control. Elevation, compression at the point of bleeding and along the line of the artery by pads and bandaging and cold, are available means.

A dangerous result of hæmorrhage sometimes is syncope of a profound character through loss of blood to the brain and consequent loss of function, or paralysis.

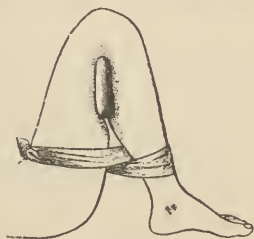


FIG. 28.—PAD AND FLEXION TO CHECK HÆMORRHAGE.

It may then be necessary to supply the brain with blood at the expense of other parts of the body, and this is done by bandaging the extremities with Esmarch's rubber bandage, or by rollers very tightly applied. When consciousness is restored and breathing becomes natural, the bandages may be taken off gradually.

Blood in the *urine* indicates bleeding in the kidneys, bladder, or the passages from either, and is called *hæmaturia*. The character of it indicates the source of the bleeding and should be carefully observed and reported. Thus, if from the kidneys, the urine will be colored throughout; if from the bladder, the bleeding follows micturition, etc.

*Epistaxis* is bleeding from the nose. It is common in young persons and is usually harmless, and sometimes gives relief from head symptoms, such as dizziness, headache, etc. In older persons it is a more serious



FIG. 29.—PLUGGING  
THE NARES.

symptom. For checking it, position is often all that is required. Hold the chin up and elevate the arm on the side of the bleeding; loosen tight clothing about the neck; apply ice, or ice-water to the back of the neck and forehead; inject, or have snuffed up a solution of salt or alum. If the bleeding

is persistent, it may become necessary to plug the nares. The best procedure when the articles are available is a soft rubber catheter threaded through the eye like a needle; then pass the threaded end through the nostril into the throat and pull the thread out of the mouth with a forceps or hook; then tie to it a

pledget of cotton or a small sponge and draw it up to the nares ; tie the strings over a plug in the anterior opening (Fig. 29).

Bleeding from the stomach is accompanied by vomiting of the blood, called *hæmatemesis*. The vomit has the appearance of coffee-grounds. Quiet is absolutely necessary ; small pieces of ice may be swallowed ; ice, or ice-bags over the stomach are helpful. Stomach bleeding should not be mistaken for swallowed blood.

*Intestinal hæmorrhage (enterorrhagia)* is usually symptomatic, frequently a result of the ulcerations of Peyer's glands in typhoid fever. The application of cold in some form and absolute quiet are necessary, and if possible elevation of the abdomen. Cold may be applied by ice-water enemata, ice introduced in the rectum (especially in bleeding piles), or by ice-bags to the abdomen.

Bleeding from the lungs is called *hæmoptysis*. It is distinguished by its bright red color and frothiness. Death seldom results immediately, even when large vessels are involved, but the indications are very serious. The patient should be placed in a horizontal position and kept perfectly quiet ; small pieces of ice may be swallowed ; an ice-bag may be applied to the chest, and the patient must be enjoined not to speak or swallow food. An old popular remedy is swallowing a spoonful of dry salt, but the danger from vomiting overcomes any possible benefit.

Uterine hæmorrhage will be considered in the chapter on obstetrics.

## CHAPTER IX.

### WOUNDS ; BURNS AND SCALDS ; EMERGENCIES.

A *wound* is defined as a solution of continuity of the soft parts ; which means a rupture of the soft tissues, including the skin or mucous membranes.

Wounds are classified as *incised*, *lacerated*, *contused*, *punctured*, *poisoned*, and *gunshot*.

An *incised* wound is a smooth, clean cut, and is usually made by some sharp-cutting instrument. It is the most favorable wound for quick healing.

A *lacerated* wound is one in which the edges are torn and ragged, and in which the vitality of the injured parts is often seriously impaired. These wounds are more painful, but the hæmorrhage is more easily controlled.

In *contused* wounds the injury to the fleshy parts, or bruising, is much more extensive than in lacerated wounds. It occasions swelling and discoloration from extravasation of the blood. If the vitality of the part is completely destroyed, ulceration separates the dead tissue and it sloughs away.

*Punctured* wounds are inflicted by sharp-pointed instruments. They are sometimes dangerous from their depth, a lack of free exit for discharges, and deep injuries of vessels which give rise to concealed hæmorrhages.

*Poisoned* wounds are caused by the absorption through a cut or laceration of infected or poisonous fluids, frequently from a dead body (dissection wounds).

*Gunshot* wounds are produced by missiles, and are of the nature of contused and lacerated wounds.

*Contusions* or *bruises* differ from contused wounds in the fact that the skin is not broken, although there may be extensive laceration of the tissues, and much more swelling than if the skin permitted the exudation to escape.<sup>1</sup>

Wounds may heal either, (1) by *first intention*, which means the growing together of two clean cut surfaces without suppuration, or by primary union.

(2) By *granulation*, or the filling up of a wound by new tissue, which has a red, granular appearance, and is bathed with healthy pus; these two granulating surfaces, being brought together, unite.

(3) Under a *scab* formed by dried lymph, which seals the wound from the air, and underneath which the new skin forms.

A *cicatrix* (plural, *cicatrices*) is the contracted new formation over the site of a wound; it seldom regains the full vitality of the original part.

In dressing of wounds the first thing to do is to irrigate them thoroughly with an antiseptic solution and to remove any dirt or blood-clots. After the hæmorrhage has been controlled, if the wound is deep, drainage tubes or a few strands of sterilized horse-hair should be introduced to the bottom of the wound,

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<sup>1</sup>When not too severe they may be dressed by applying several thicknesses of lint saturated with lead water, or a solution composed of muriate of ammonia, grs. xx.; laudanum and alcohol each, f 3 i; water, f 3 i.

allowing it to protrude from the lower part of it. If the edges can be brought well together with superficial sutures, drainage will not be required. If the wound

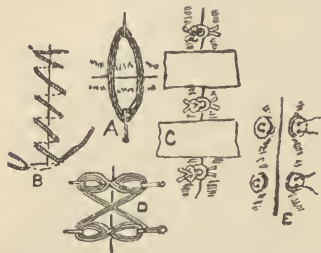


FIG. 30.—SUTURES. A, India-rubber suture ; B, continued suture ; C, interrupted sutures ; D, hare-lip suture ; E, button suture.

is not deep, interrupted sutures (Fig. 30) of catgut, silver wire, or silk, can be introduced.<sup>1</sup> If the wound be a deep one involving the muscles, deep (hidden) sutures of catgut must be applied. The subsequent dressing is the

dusting of the surface with aristol or iodoform, a piece of protective somewhat larger than the wound dipped in 1 to 40 carbolic solution placed over it ; then is applied a pad of antiseptic gauze soaked in the carbolic solution, and over this a pad of dry sterilized gauze overlapping the wet by a few inches. A few layers of bichloride cotton are then put on and the whole secured by an antiseptic gauze bandage. If properly done, the dressing need not be disturbed until the wound is healed, but usually it is better to remove the stitches at the end of a few days.

The greatest care must be exercised with the instru-

<sup>1</sup> In applying the suture, the edges of the wound should be held with the finger, or forceps, and the needle, previously threaded, thrust through the skin from one-fourth to one-half inch from the edge ; the curved needle then passes from within outward through the tissues of the opposite flap at the same distance from the edge. If the suture is silk or catgut, it should then be tied ; if wire, twisted, and then cut off. They must not squeeze the edges of the wound, and should be placed so as to bring the parts accurately together.



ments used about a wound. Needles, scissors, forceps, etc., should be cleansed with soap and water to remove the oily surface left on them, and then be laid in a 1 to 20 carbolic solution for at least ten minutes. After use and before being put away they should be cleaned and thoroughly dried.

In the case of lacerated wounds, if the edges are very ragged, or so much crushed as to have their vitality destroyed, they may be trimmed with a pair of scissors to get surfaces that will unite. If the edges are badly crushed, it may be advisable not to suture them, but to bring them together with a few strips of isinglass plaster moistened with bichloride solution. It takes longer for a lacerated wound than an incised wound to heal. In lacerated wounds caused by machinery, particularly of the extremities, a satisfactory method of treatment is by continued irrigation (Fig. 31).<sup>1</sup>

If no foreign body or dirt remains in a punctured wound, it heals rapidly. Sometimes it is necessary to open a punctured wound (make an incised wound) in order to clean it properly. If bleeding from a wound is obstinate, the bleeding vessel must be found and treated as laid down in the chapter on Hæmorrhage.



FIG. 31.—IRRIGATING APPARATUS.

<sup>1</sup> Continued irrigation of a wound can be arranged by suspending a vessel over the wound, with lamp-wick or a skein of thread with one end in the liquid and one end suspended over the vessel. A rubber cloth under the part is arranged to lead the liquid into another vessel. The liquid should be a warm solution of bichloride, 1 to 5000, or 1 to 10,000, or carbolic acid, 1 to 60.



In redressing a wound the old dressings must be irrigated until they come off easily. In removing adhesive plaster, traction should be made from both sides, and it is safer to protect the edges of the wound with new strips before removing the old. The remains of plaster can be removed by alcohol or ether. When the dressings are taken from a wound they should be put in a vessel and removed at once from the ward or room, and should be burned, particularly if they are soiled by discharges. All dressings must be washed and thoroughly disinfected before being used again. A wound should never be left exposed. If it cannot be dressed, cover it with gauze or lint saturated in antiseptic. A wound should always be gently cleaned with warm antiseptic before applying new dressings.

In granulating wounds there is an absorbing surface that it is difficult to keep free from infection. The granulations, too, must be kept in a healthy state. They may be too active, grow too rapidly (proud flesh), and in such case they must be checked by the application of lunar caustic (nitrate of silver); if they are pale and inactive, they need stimulating by some application, preferably balsam of Peru.

If germs can be kept from a wound, it is said to be *aseptic*; if not, the wound is said to be *infected*.

*Burns* and *scalds* are injuries to the tissues produced by heat. If by dry heat, it is termed a burn, and if by moist heat, a scald. They are classified as burns or scalds of the first, second and third degrees, according to the depth they have penetrated, but they are dangerous more in proportion to the extent of surface affected than to their depth. Burns of the first degree affect only the superficial skin, and there is a reddening

and slight swelling. Sometimes the cuticle separates. If the burn is deeper, or of the second degree, it involves the true skin, and blisters will be formed containing clear or bloody serum. If the burn involves the tissues beneath the skin, it is of the third degree ; the vitality of the part is destroyed and it gradually sloughs off leaving a wound which heals by granulation.

The immediate and serious danger from burns and scalds involving considerable extent, is from shock. Burns are usually fatal where one-third of the surface of the body is burned. *Shock* is a complete prostration of the vital powers, and is manifested by dulness and apathy, a pale surface covered with cold perspiration, cold extremities, feeble pulse, low temperature, and muscular weakness. Sometimes death results at once from a failure of the patient to rally, and usually the recovery from shock is slow. For the treatment of shock, keep the patient's head low ; give hot tea, coffee, and stimulants ; put hot bottles to the extremities, and aid the circulation by friction and heat.

Next in importance to shock is the exclusion of air from the burned surface. When the burn is superficial, the application of lint saturated with a solution of bicarbonate of soda, or sprinkling the powder of the same over the burn, and then wrapping the part in moist gauze and a layer of cotton held in place by a roller, will relieve the pain. If soda is not at hand, flour may be used. In burns of the second degree, carron oil<sup>1</sup> spread on lint and laid over the surface ; or rubber tissue perforated, covered with cotton and kept in place by a bandage, affords relief. Carron oil needs frequent

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<sup>1</sup> Equal parts of lime-water and olive oil.

changing. Blisters should be opened near their edges and the serum soaked up by absorbent cotton. Lint then soaked in a soda solution<sup>1</sup> can be laid over the surface ; or zinc ointment, bismuth ointment, or carbolic oil. The most reliable antiseptics—carbolic acid, corrosive sublimate, and iodoform—cannot be used on account of the danger of absorption. *Creolin* is said to be as efficient as carbolic acid and not poisonous. Aristol can be dusted over the surface or used as ointment. If suppuration or sloughing occurs, the wound must heal by granulation. Frequently overgrowth of granulation (proud flesh) must be checked with nitrate of silver. If the surface deprived of skin is large, skin grafting is resorted to. The cicatrix caused by a burn tends to contract and sometimes causes great deformity. To counteract this, splints are sometimes used.

*Powder burns* should be treated in the usual way, but care should be taken to pick out the small masses of powder with a needle, or permanent spotting will result.

The after-treatment for wounds should be supporting, but the diet should be guarded and light. A complication of severe burns is brain disturbance,—in children, convulsions. Pneumonia is especially liable to occur, and ulceration of the small intestine (seldom under the tenth day). Scalding of the air passages is serious. Inhaling the steam from lime-water may be soothing. Continuous warm-water baths are recommended in burns of the third degree. In burns from acids, the surface should be drenched with water to dilute the acid, and alkaline solutions applied ; they are afterwards treated like other burns.

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<sup>1</sup> Soda bicarb. 3 i ; water 3 i.

The *emergencies*, both surgical and medical, are treated under the respective injuries. A nurse in the absence of a physician, is usually called upon to take charge of the case. It is sometimes difficult to determine how far she should proceed in directing treatment; but the best rule to govern her should be to give the patient such treatment, the lack of which until the doctor's arrival would be to the patient's disadvantage. Whatever is done should be tentative, with the expectation that it may be reversed by the physician; and a nurse should anticipate this and not place herself in a false position. If a nurse is in doubt about the best procedure, make the patient as comfortable as possible and await the doctor. The greatest aid will be in keeping cool and keeping others so by example. See that the patient has fresh air and is not surrounded by a crowd; or have the patient carried to the nearest house, if injured out-of-doors. If shock is great, proper treatment for it should be commenced at once; also for fainting. In case of a fracture do not allow any attempt at reduction if a physician is available, but arrange the part to make the patient as comfortable as possible. If the fracture is compound and the bone protrudes, do not return it until the wound is thoroughly cleaned and disinfected. If the ribs are fractured a broad bandage fastened snugly around the chest will give the patient comfort. In injuries to the head with suspected fracture, keep the patient in a quiet place and apply cold to the head. In case of a dislocation and the diagnosis is plain to the nurse, an effort at reduction can be made at once. With wounds, the surfaces should be cleaned, the hæmorrhage arrested, and the edges of the wound brought together.

## CHAPTER X.

### ANÆSTHESIA, ANÆSTHETICS.

THE term *anæsthesia*<sup>1</sup> is applied to conditions of insensibility or loss of feeling, produced artificially by substances called *anæsthetics*.

The use in medicine of this condition is to alleviate pain during an operation, to relax spasm, and to aid in the diagnosis of obscure diseases. Anæsthetics may be either general or local in their effects. When they are general, the condition is produced by inhaling vaporous substances into the lungs where it is taken up into the circulation and carried to the brain. Local effects are obtained by applying the anæsthetic to the part to be affected, or by injecting it underneath the skin.

In the absence of sufficient medical assistance, the nurse is sometimes called upon to administer the anæsthetic, and should therefore be fully acquainted with the technique of the operation.

The state of complete anæsthesia borders closely on the state of death, and this fact should be appreciated in order to fully realize the dangers that exist; in fact, anæsthesia sometimes passes beyond the boundary line and the patient does not awake.

The *preparation* of a patient for anæsthesia should begin at least six hours before it, and for that period

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<sup>1</sup> This term was introduced in 1847 by Sir James Y. Simpson.

no solid food must be taken. Some light liquid diet or a cup of tea or coffee is admissible two or three hours before it. Vomiting is quite sure to result if an anæsthetic is given after a hearty meal, and there is danger that during the unconscious state the vomited matter may be drawn into the trachea, and result in suffocation. The nurse should, therefore, see that all vomited food is removed from the mouth. In feeble patients, a stimulant may be given half an hour before anæsthesia. The periods of greatest vital activity are in the morning and early afternoon, and these are indicated for an operation.

A hypodermatic injection of  $\frac{1}{6}$  to  $\frac{1}{3}$  grain of morphia half an hour before giving an anæsthetic will favorably modify its action. It reduces the stage of excitement and the tendency to vomit, and it is said to lessen the amount of anæsthetic required.

The clothing should be loose but light and warm. Nothing that will interfere with respiration should be allowed. False teeth must be removed and the urine should be voided.<sup>1</sup> If it is suspected that the rectum is loaded, an enema should be given.

The proper position for the patient is the recumbent one for all ordinary operations, either with the head low, or resting upon a very small pillow. The temperature of the room should be not below 70° F. and if the operation exposes the bowels, 80° F., and free ventilation must be provided for. All sources of excitement to the patient should be avoided, therefore instruments and all preparations for the operation must be out of sight, perfect quietude enjoined, and whisper-

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<sup>1</sup> If from excitement or other cause the patient cannot pass the urine, it should be removed by catheter.

ing avoided. All appliances should be near in case of an emergency requiring resuscitation; the principal articles being a battery, a mouth-gag, a pair of forceps to draw out the tongue, a tongue depressor or table-spoon, ammonia, brandy or whiskey, digitalis, strychnine and atropine for hypodermatic use, and a hypodermatic syringe.

A towel should be laid across the chest underneath the chin. An extra towel and basin should be near. There should be at hand a supply of the anæsthetic, towels, and inhalers.

Before starting, the pulse should be taken. Care must be exercised not to let the patient suddenly shift position, especially to sit upright, as it might occasion dangerous fainting. It is necessary to gently but firmly restrain the patient during struggles. Sometimes a reassuring word will have a quieting effect.

The anæsthetic may be ether, chloroform, or a mixture of the two.

*Ether* is a colorless, highly volatile liquid, having a peculiar odor, and a burning taste which is followed by a sensation of cold. It is very inflammable and for this reason no light should be permitted where it is used. It is the safest known anæsthetic, and is used in this country more than any other. Ether cannot be used in acute inflammation of the respiratory organs, in long operations about the respiratory openings, or where the cauterly is used about the head. When inhaled, ether produces a burning and choking sensation due to the local irritation. The first systemic effect is a sense of lightness of the head, with a roaring or buzzing in the ears. Soon there is a feeling of great distance between objects, and this is succeeded by the unconscious state.



*Chloroform* is a colorless, highly refractive liquid, with an agreeable aromatic odor, and a sweetish taste. It is very volatile and mixes freely with air. It is a powerful irritant to the skin, and if kept in contact with it, will cause a blister. Hence the face should be protected with vaseline in administering it. When the vapor of the chloroform is inhaled, it produces symptoms not unlike those induced by ether. There is no choking sensation, and the stage of excitement is shorter.

When ether is given, there is no better inhaler than a napkin or a towel twisted into a cone. This may be stiffened



FIG. 32.—ETHER INHALER.

by leather or paper, and an opening left in the top which should be filled with a sponge or absorbent cotton (Fig. 32).

Saturate the cone slightly with ether and bring it gradually to the face, so as not to alarm the patient or produce an unnecessary sense of suffocation. Ask the patient to "blow out," and then the requisite inhalation will surely follow. Anæsthesia should be brought on slowly, and it cannot be expected to be fully completed under five minutes. Keep the air breathed saturated as uniformly as possible and add the ether in small quantities frequently. Complete anæsthesia may be recognized by muscular relaxation.<sup>1</sup>

<sup>1</sup> Raise the arm of the patient and allow it to drop by the side. Patient appears in a deep sleep; the eyes are closed; movements of respiration are fewer; there may be snoring; lift the



When it is complete, the anæsthetic state should be maintained by small quantities of ether.

The *signs of danger* of ether narcosis are the stoppage of respiration,<sup>1</sup> the face becomes purple,<sup>2</sup> and the pupils dilate rapidly. The inhaler must be at once removed when any of these signs appear, and pressure made upon the chest to start breathing. If the breathing is not fully restored, the head must be promptly lowered and the tongue drawn out of the mouth. The teeth may be tightly closed, as in lock-jaw, and if so, must be pryed apart by a wedge or other means. Slapping the face with a towel dipped in cold water is sometimes effective; or a little ether poured upon the abdomen or chest will produce a shock. If none of these means are effectual, then Sylvester's method of artificial respiration must be resorted to (see chapter on Artificial Respiration).

Patients recover from the effects of ether differently—some awake quietly as from a sleep after the withdrawal of the ether, and others are garrulous and incoherent. Nausea and vomiting very commonly follow ether-inhalation, as well as headache, hiccough, and occasionally cough.

The "open method" is the one generally employed for the administration of chloroform in this country.<sup>3</sup>

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eyelid and touch the conjunctiva, and if there is no wincing, insensibility is complete.

<sup>1</sup> By paralysis of the respiratory centre; breathing suddenly stops, the heart continuing to beat for a time.

<sup>2</sup> From imperfect oxygenation of blood.

<sup>3</sup> A towel or napkin is folded into a kind of cup-shaped hollow, and held securely in the hand; upon this is poured the chloroform. At first it is held two or three inches from the nose of the patient, gradually lessening the distance as the effect is produced. Quantity used at any one time should not

The same preparation is required as for ether-narcosis. Hearing is the last one of the senses to be lost, hence conversation must be guarded. The person attending to the anæsthetic must give undivided attention to the work and must not be diverted by other proceedings. The pulse, respiration, and color of the face must be closely watched. When beginning to administer chloroform, request the patient to breathe gently and quietly. The signs of complete narcosis are the same as those given for ether. Sometimes when everything seems to be going on well, the heart suddenly stops beating. Death in this manner is not recovered from, but every effort should be made to restore the circulation.

Chloroform is pleasanter than ether to take, is less irritating to the mouth and respiratory passages, its action is much more rapid, and its after effects less disagreeable. It is generally conceded, however, that it is a more dangerous agent than ether.

In obstetrics it is used almost exclusively, and statistics seem to show that in parturition it is a perfectly safe agent.

Where it is possible, and particularly in hospital wards, the patient should not be removed to the operating room until after anæsthesia has been induced.

Local anæsthesia is a loss of feeling in a limited part of the body, and may be caused in a variety of ways. Among the more common local anæsthetics are cocaine (hydrochlorate), ether, carbolic acid, methyl chloride, and ice. It is used in minor surgical operations and for the relief of severe pain.

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exceed half a drachm, a few drops being added from time to time.—*Adler*.

*Cocaine* is a powerful, efficient, and convenient local anæsthetic. It is used in solutions from two to twenty per cent. Upon mucous membranes a pledget of cotton saturated with the solution can be held to the part for a few moments. It can also be subcutaneously injected into the tissues. Applied to the skin even in the stronger solution it exerts but little effect. For amputation of the fingers it is injected hypodermatically and the circulation is then retarded by ligature. In the same way it may be used for the removal of ingrowing toe-nail, opening of abscesses, etc. For hypodermatic use a 4 per cent. solution is sufficient. Toxic symptoms may be produced if a strong solution is injected or is applied to a raw surface where absorption may occur. It is especially valuable in operations upon the eye, throat, and nose.

Carbolic acid when applied to the skin at first causes irritation and pain, but soon produces complete anæsthesia of the part. Its effect does not penetrate deeply and it acts as a caustic.

The ether spray by its rapid evaporation produces a cold sufficient to freeze a part and render it temporarily insensible. The spray is applied by a hand atomizer, and the skin rapidly becomes white and hard. The freezing process must not be carried too far or a slough will ensue.

Two parts of ice and one of salt is called the *frigorific* mixture. Thoroughly pulverize the ice and then quickly mix it with the salt in a muslin bag and place it on the part to be affected. The skin becomes white and hard, or, in other words, is frozen and insensible.

## CHAPTER XI.

### SURGICAL NURSING ; OPERATIONS.

WHEN the surgeon entrusts to the nurse the preparation of the instruments and dressings for an operation, or the preparation of the patient, it is a proof of his confidence, and one that the nurse should endeavor to deserve.

The first preparation a nurse should make is in her own person. Her hair must be dressed tightly and firmly fastened, and then wear a cap that will completely cover it, and one that is clean beyond a shadow of a doubt. Cleanliness applies to all of her clothing. The hair should have been washed within a day or two with boric acid solution. A nurse is not considered eligible for an operation if she has been exposed to infection for a week previous to it. The hands and arms should be thoroughly scrubbed with soapsuds and a nail-brush, afterwards well rinsed, and finally bathed in a 1 to 2000 bichloride solution. Rings and bracelets should be removed. She should have ready for the operation a clean linen apron, reaching from her neck down to the floor and almost surrounding her.<sup>1</sup> A pair of sleeves should be fastened to it, coming down midway between the elbow and wrist and fastened snugly

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<sup>1</sup> An overall is made with sleeves that is convenient and simple.

around the arm. She should have prepared similar garments for the surgeon and his assistants.

A perfect knowledge of antiseptics is necessary. The object of antiseptics must constantly be borne in mind. Surgical cleanliness means an atmosphere, instruments, and operators reasonably free from pathogenic germs, so that raw surfaces made in the operation will not give lodgment to germs and make an infected wound. Therefore no small detail must be overlooked or it will render useless all other preparations.

The *patient* should have a warm, cleansing bath the day before. For at least four hours before the operation the patient should not eat (see Chapter X.). On the morning of the day of the operation the colon should be cleansed by a simple enema; and the nurse must be satisfied that the bladder is emptied before the operation. Observe all the precautions given for anæsthesia. The nurse must do nothing to excite fear in the patient—no bustling or excitement—wear an everyday expression. Have the patient's clothing arranged so it can be easily changed if necessary, and protect it as much as possible. In case of a prolonged operation a flannel jacket may be worn.

The skin upon the region of the proposed operation may be rubbed over with a pledget of cotton saturated with spirits of turpentine, if the skin is not broken; next thoroughly washed with soap and water. If there are hairs, they should be shaved off. After washing, there should be carefully applied a 1 to 1000 bichloride solution, or a 1 to 20 carbolic solution, and it is then covered with a towel wrung out of a 1 to 2000 bichloride solution until the surgeon is ready.

It may be a duty of the nurse to prepare the *room* for

the operation. If the operation is to be a long one the room should be heated to  $75^{\circ}$  F. ; or if the abdomen is to be opened, to  $80^{\circ}$  F. It should be thoroughly cleansed after removing all unnecessary furniture, as far as possible wiped with a disinfectant, and well-aired. Arrange to have the temperature kept uniform. The legs of the patient may be wrapped in blankets. See also that the bed is prepared that is to receive the patient after the operation ; that the sheets are well-aired and dried ; and that hot-water bags are ready to apply artificial warmth if necessary. Have a supply of hot strong coffee and brandy on hand ; also a basin ready in case of vomiting.

The *operating table*, if in a private house, may have to be prepared by the nurse. The best size for a table is 30 inches wide by  $6\frac{1}{2}$  feet long. If two ordinary kitchen tables are available, they can be tied together, or it may be necessary to have several boards cut to the proper size, and laid upon an ordinary table. It should be covered with several folded blankets, and over that a rubber sheet or oilcloth ; and all to be covered with a clean sheet and snugly tucked in. A thin pillow will also be needed. If there be a carpet upon the floor this should be protected with rubber sheets or ordinary washable bedding. The table should be placed to get the best light for the operation. The room should be well lighted. If the operation is performed at night, be certain to have two lights, as one will throw perplexing shadows. There should also be a table for instruments, dressings, etc., and another for water supply and antiseptics.

The nurse must see that plenty of antiseptic liquid is provided, abundant water, both hot and cold, and a

large vessel to receive the waste ; a sufficiency of clean towels, soap, pins, threaded needles, scissors, and several clean nail or tooth brushes. There should be two ample basins in which the sponges may be cleansed ; a basin containing carbolic or bichloride solution to dip the hands in before or during the operation and one of carbolic solution, 1 to 20, in which to lay the instruments.

Every vessel in the room should be thoroughly disinfected before use, as well as any other article to be used. Too great care with this particular cannot be exercised. None of these preparations must be made in sight of the patient, and as the operating room will probably not be the one in which the patient is lying, this will not be difficult to avoid. The anæsthetic is given before the patient is taken to the operating room. The patient should have the full benefit of the anæsthetic and consciousness should not be allowed to return until the patient is again placed in bed after the operation. The operating room should not be a picture for the patient to think of during recovery.

After the patient is on the table, the surface (skin or clothing) surrounding the operation is to be covered with towels wrung out of a hot bichloride or carbolic solution. They should be changed before they grow cold. The wound is irrigated freely during the operation by a 1 to 3000 bichloride solution, used warm ; this can be applied by an irrigating apparatus<sup>1</sup> or with a syringe.

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<sup>1</sup> An admirable irrigator (Fig. 33) can be extemporized with a half-gallon fruit jar, or pitcher, and several feet of small rubber tubing. One end of the tube can be weighted to remain in the jar. The other should be a free end for directing the liquid. The tube should be tied to the lower part of the jar (outside),



If the surgeon gives over to the nurse the sterilizing of the instruments, she should carefully scrub them with warm water and soap, care being taken that the joints are freed from any foreign matter. If the instruments are constructed with metal handles, they can be sterilized by boiling. After being thoroughly cleansed they should be placed in a metal or porcelain tray and covered with a 1 to 20 carbolic solution (bichloride cannot be used for metal). Instruments that rub against clothing or fall to the floor must be placed in the carbolic solution again before using.

The *sponges* require particular care. New sponges can be made surgically clean by putting them into a bag and beating them until the sand falls out, then strain them in cold water, until the water does not cloud.<sup>1</sup> Then after thorough rinsing and straining, place them in 1 to 20 carbolic solution, or a 1 to 1000 bichloride solution where they can remain until used. A sponge should not be used that has not been soaked in water three days and in bichloride, 1 to 1000, or

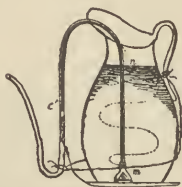


FIG. 33.—SIPHON IRRIGATION.

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the tube filled with the liquid by sucking it through. This will act as a siphon and as the level of the tube cannot be raised above the liquid the seal cannot be broken, and it is always ready.

<sup>1</sup> To bleach sponges, place them in an earthenware vessel and fill the vessel with a half per cent. solution of permanganate of potash, leaving them for three hours. The sponges are then rinsed and laid in clean water for twenty-four hours. They are strained and then laid in a two per cent. solution of hyposulphite of soda. To this is added thirty drops of strong muriatic acid to every quart of the liquid, and they are left for half an hour (not longer), taken quickly out and thoroughly washed. They are then very soft and white. Do not leave them in the acid solution long enough to burn them.



carbolic 1 to 20, for two weeks. Sponges once used must be thoroughly soaked and cleansed, and left in bichloride solution for a fortnight. When sponges are to be used they are taken directly from the disinfectant, strained out and laid in a basin with a weak solution of carbolic. Sponges used for infected wounds should never be used again, but should be destroyed.

It may sometimes be the duty of the nurse to prepare ligatures or dressings, but they are usually provided by the surgeon.<sup>1</sup> In cases of emergency, when the

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<sup>1</sup> Silk for sutures or ligature should be sterilized by boiling for half an hour in a 1 to 20 carbolic solution, then kept in bottles and covered with carbolic solution or alcohol.

Silk-worm gut may be kept dry in glass jars or preserved in alcohol, and should be immersed in a 1 to 20 carbolic solution for a few minutes before being used.

Catgut of a selected size may be placed in oil of juniper berries for a week and then put in absolute alcohol until used. No. 1 is the usual size.

Drainage tubes are prepared from rubber tubing of different sizes perforated at short intervals. They are also made of glass. They can be kept dry and soaked in carbolic solution half an hour before using.

Catgut and horse-hair can be used for drainage and should be sterilized in the usual way.

Protective (employed to prevent the wound from being irritated) can be made by coating oiled silk with copal varnish, or rubber tissue may be employed. Let it rest in a bichloride solution before applying.

Gauze dressings can be made of cheese-cloth. For bichloride gauze take thirty yards and place in a kettle covered with water, add two pounds wash soda, and boil an hour. Then wash in clean water and pass through a wringer. Then immerse in a 1 to 1000 bichloride of mercury solution for 24 hours. Dry, cut into pieces, and pack in glass jars or tin boxes.

For carbolized gauze, after cheese-cloth is washed as directed, soak a few hours in a mixture of carbolic,  $\frac{3}{4}$  xii; castor oil,  $\frac{3}{4}$  xxiv; alcohol 5 pints, and resin 1 pound.

Sawdust dressing is made by soaking in bichloride solution for 24 hours and then drying. After it is dry it is put in loose bags.

Bichloride cotton is made by soaking absorbent cotton in a 1 to 1000 solution for 24 hours and drying.

ordinary gauze dressings cannot be obtained, old muslin or linen may be used if properly sterilized. Old sheets torn into a half dozen pieces may be boiled for a few minutes and then saturated in strong bichloride or carbolic, when they are ready to use.

A nurse's duty at an operation will be assigned by the operator. If it is to hand instruments or dressings, take particular care that nothing is used not properly sterilized. If any article to be used touches the floor, table, or clothing, it should be laid aside. The sponges will need the care of one person. As fast as they are used they should be thoroughly rinsed and thrown into the disinfectant, and as they are needed should be squeezed out dry. Sponges must be all accounted for at the close of the operation.

When the patient is finally placed in bed, vomiting must be watched for, and the patient's head must not be raised until the effects of the anæsthetic have worn off. If vomiting is persistent, iced cloths to the throat may control it. Drinking of water should be restricted. Hæmorrhage must be carefully watched for during the first day.

The clinical records following an operation should be quite detailed, no change in the patient being unimportant. The temperature is taken frequently during the first few days. The urine needs particular care and should be measured and a sample saved for examination. When the stitches are removed, or for any reason dressings must be disturbed, the same precautions regarding sterilization are required for re-dressing as for an operation.

## CHAPTER XII.

### POISONS, BITES, STINGS, ETC.

A *poison* is any substance which destroys life or impairs the bodily functions. It may enter the body by any avenue, or be applied to the surface. The best classification of poisons is (1) *irritants*, and (2) *neurotics*. The irritant poisons act by causing inflammation of the parts they reach, and the neurotic poisons act chiefly on the brain, spinal cord, and nerves, and include the narcotics. Some poisons belong to both classes.

The *action* of poisons may be local, remote, or both combined. To illustrate, carbolic acid acts as an intense irritant to the stomach ; strychnine acts remotely upon the spinal cord, and corrosive sublimate acts both locally and remotely. The action of poisons may be modified by the size of the dose, by the condition of the body, by habit, and by peculiarity of the patient.

Poisons may be taken into the system directly through the blood, as from absorption from wounds or injection into the blood-vessels ; or they may be absorbed from the skin, serous or mucous membranes, as when taken into the stomach ; or they may be absorbed through the lung tissue as vapor, as chloroform, etc.

The diagnosis of a poison is based upon the symptoms it produces, upon the detection of poison in the articles of food and drink, in the secretions of the body, or in

the confession of the patient or person administering it.

Acute *irritant* poisoning may be suspected when violent purging or vomiting occurs, and pain in the region of the stomach with great prostration; and acute *neurotic* poisoning manifests itself by sudden affections of the nervous system, such as stupor, delirium, convulsions, etc., without other assignable cause.

Poisoning may be confounded with diseases. Irritant poisoning is simulated by cholera, gastritis, colic, etc.; and neurotic poisoning by apoplexy, sunstroke, uræmia, epilepsy, etc.

In the detection of poisoning, either for treatment or other purposes, its discovery in the remains of food, or drink, or in vomit, is of great importance; but greater still is its detection in the urine; when it is found there it establishes the case beyond a doubt.

Poisons may be taken accidentally or with the intention of self-destruction, or be given with homicidal intent. It is when taken under the two former conditions that it comes within the nurse's province, and requires her prompt and intelligent action to avert the worst results; therefore, she should have a knowledge not only of the signs but of the proper preliminary treatment of acute poisoning.

The treatment of poisoning is directed to the removal of the poison, and to neutralizing its poisonous effects; or a remedy may act mechanically or chemically. A remedy for neutralizing or removing poison is called an *antidote*.

Where it is ascertained that a poison has been taken into the stomach, an emetic should be administered without delay. Either mustard, or salt and warm

water is nearly always available. Take a tablespoonful of mustard to a cup of warm water, and repeat it every five or ten minutes until free vomiting occurs. The same amount of salt may be used. Putting the finger into the pharynx will hasten the result. Sulphate of zinc, 10 grains to a cup of water, or powdered ipecac in the same amount, are also effectual. If the apparatus is available, washing out the stomach is the quickest way to rid it of the offending substance. Too large a quantity of fluid should not be taken, as over-distension may paralyze the muscular walls and defeat the object, so that emetics should be condensed.

In *corrosive* poisons, the action on the membranes is rapid, and the tissues are destroyed. The object should be to dilute the poison with some bland fluid that will soothe the injured parts, such as mucilage, flaxseed tea, oil, etc. ; or, if the poison is known, the antidote should neutralize it, if possible, by chemical action, and thus render it harmless.

In neurotic poisoning the action is remote and systemic, and, although the stomach should be emptied to get rid of any poison remaining unabsorbed, treatment should be directed to overcome the systemic effects.

#### LIST OF COMMON POISONS WITH THEIR SYMPTOMS AND THE ANTIDOTES.

##### *Corrosive Poisons.*

*Acids and Alkalies:* They act by excoriating the parts they reach, and cause vomiting, pain throughout the stomach and abdomen, feeble pulse, clammy skin, and symptoms of collapse.

*Carbolic Acid:* Burning pain from the mouth to the stomach, giddiness, loss of consciousness, and collapse; pupils contracted; urine black; subnormal temperature. *Antidotes:*

Evacuate stomach ; give chalk, milk, white of egg, lime-water, oil, and demulcent drinks ; keep up warmth of body and stimulate if necessary.

*Oxalic Acid*: Hot acrid taste ; burning, pain, collapse. *Antidotes*: Lime-water, chalk, and demulcents.

*Sulphuric Acid (Oil of Vitriol)*: Makes black stains ; same symptoms as carbolic, and same *antidotes*.

*Acetic, Citric, Nitric, Muriatic, and Tartaric Acids*: All highly corrosive or irritant, and accompanied by pain in stomach, vomiting, and collapse. *Antidotes*: Alkalies to neutralize the acid. For sulphuric, strong soapsuds ; for the others, any dilute alkali, such as lime-water, chalk, magnesia, and demulcent drinks.

*Prussic Acid*: Dyspnœa, vomiting, spasms, rigidity, an odor of peach kernels, stoppage of the heart. Death occurs by asphyxia. *Antidotes*: Dilute ammonia ; opium to relieve pain ; alternate cold and warm affusions to the spine ; heart stimulants ; artificial respiration.

*Ammonia*: Burning pain in the mouth, chest, and stomach ; lips and tongue swollen ; dyspnœa, vomiting of blood ; odor of ammonia. *Antidotes*: Dilute vinegar ; lemon juice ; sour cider ; fruit juices, etc. ; oils and demulcent drinks.

*Potash, Soda (Lye), Lime, etc.*: These are all caustic, and present the same symptoms as ammonia, and require the same *antidotes*.

### *Irritant Poisons.*

*Antimony (Tartar Emetic, Wine of Antimony, Syrup of Squills)*: Violent cramps and purging ; vomiting, pain, delirium, collapse ; metallic taste ; great thirst and difficulty of swallowing. *Antidotes*: Emesis ; tannic acid ; infusion of oak bark ; strong tea ; demulcent drinks.

*Arsenic (Paris Green, Scheele's Green, Fowler's Solution, Rough on Rats)*: Violent burning pain in the stomach ; retching ; thirst ; vomiting ; purging ; suppression of urine ; dryness in throat and sense of constriction ; clammy sweat ; pulse small and frequent, and collapse. *Antidotes*: An emetic of mustard and water ; the special antidote is the hydrated sesquioxide of iron, and can be made by adding water of ammonia to muriated tincture of iron, and by washing the precipitate ; given in milk and water. Or dialyzed iron and magnesia.

*Copper (Blue Vitriol, Verdigris)*: Metallic taste in the mouth ; griping and colicky pains ; vomiting ; purging with straining ; jaundice ; dyspnœa ; small and quick pulse, and collapse. *Antidotes*: Emetics ; milk ; oil ; flax-seed tea ; barley water ; opium to allay pain ; poultices to the abdomen.



*Poisonous Fish (Particularly Shellfish to some Persons):* Nausea, vomiting; irritation of the eyes; depression; nettle-rash. *Antidotes:* Emetics; purgatives; stimulants.

*Iodine:* Pain in throat and stomach; yellow vomit; purging; if starch be taken vomit changes to blue color; giddiness, spasm. *Antidotes:* Emetics; starch or flour mixed in a paste, and continued emesis.

*Iron (Tincture, Syrup of Iodide, Copperas):* Metallic taste; pain; vomiting; purging; vomited matter black. *Antidotes:* Magnesia; emetics; plenty of water; ice; opium.

*Lead (Sugar of Lead, White Lead):* Dryness of throat; metallic taste; great thirst; colic relieved by pressure; constipation; cramps; spasm; paralysis. *Antidotes:* Emetics; Epsom or Glauber's salts; milk; dilute sulphuric acid; iodide of potassium; white of egg.

*Phosphorus (Matches, Phosphide of Zinc):* Vomiting and pain; vomit shines in dark; odor of phosphorus; weak heart; hæmorrhage; albumen in the urine; coma or delirium. *Antidotes:* Wash out stomach; sulphate of zinc or copper; Epsom salts; never give oil or fat.

*Mercury (Corrosive Sublimate, Calomel, Blue Mass, Vermilion):* Acrid metallic taste; burning pain in throat and stomach; vomiting; diarrhoea with bloody stools; lips and tongue white and shrivelled; pulse small and rapid; pain may be absent. *Antidotes:* White of egg; flour; emetic; iodide of potassium.

*Poison Oak and Poison Vine:* Irritation, itching, swelling, and eruption of skin; may involve throat, producing cough; thirst; vomit; colic; fever; delirium. *Antidotes:* Carron oil; solution of sugar of lead; rest; low diet; laxatives; opium.

*Santonin (Worm Medicine):* Disturbance of vision, seeing things yellow; ringing in ears; dizziness; pain in abdomen; spasms; stupor. *Antidotes:* Emetics; stimulants; chloral.

*Zinc (White Vitriol), Tin:* Corrosion of mouth; pain and burning; incessant blood-stained vomit; dyspnoea; dilatation of pupils; spasm; paralysis; coma. *Antidotes:* Carbonate of potassa or soda; milk; eggs; tannic or gallic acid; poultices to abdomen.

### *Neurotic Poisons.*

*Aconite:* Tingling in the mouth; giddiness; muscular weakness; pain in abdomen; dilated pupils; feeble pulse. *Antidotes:* Emetics; digitalis; atropine; stimulants; artificial respiration; rest and warmth.

*Alcohol (from any Alcoholic Drink, Bay Rum or Cologne):* Confusion; giddiness; tottering gait; lips livid; spasm; coma. *Antidotes:* Emetics; coffee; alternate hot and cold douches; electricity.

*Aniline (Dyes)*: Giddiness; apparent intoxication; sweating; blue mucous membranes; coma. *Antidotes*: Emesis; stimulation; artificial respiration; oxygen.

*Belladonna (Atropine)*: Heat and dryness of the mouth and throat; suppression of saliva; difficulty in swallowing; great thirst; poor vision; pupils widely dilated; noisy delirium; skin dry and a rash. *Antidotes*: Emetics; stimulants; coffee; morphine; artificial respiration.

*Bromine (the Bromides)*: Respiration and heart's action lessened; reflexes sluggish; diminished sensibility; foul breath; mind dull. *Antidotes*: Heat; stimulants; digitalis; ergot; belladonna; strychnine; artificial respiration.

*Camphor*: Characteristic odor; languor; giddiness; disturbed vision; spasm; clammy skin; pulse quick and weak; no pain or vomiting. *Antidotes*: Emetics; stimulants; warmth; hot and cold douches.

*Cannabis Indica (Indian Hemp)*: Pleasant intoxication; pupils dilated; tonic spasm. *Antidotes*: Strychnine; emetics; stimulants.

*Chloral*: Deep sleep; loss of power; pulse weak; slow respiration; pupils contracted; subnormal temperature. *Antidotes*: Emetics; heat to the extremities; massage; coffee or tea per enema; strychnine; flagellation; artificial respiration.

*Chloroform*: Excitement; incoherence; insensibility; relaxation. *Antidotes*: Draw tongue downward; fanning; artificial respiration; hot and cold douches.

*Coal or Illuminating Gas*: Headache; giddiness; loss of power; insensibility; dilated pupils; labored breathing; coma; odor of gas. *Antidotes*: Air; artificial respiration; ammonia; stimulants; oxygen; coffee; hot and cold douches.

*Cocaine*: Faintness; giddiness; nausea; pulse small, rapid, intermittent; prostration; respiration slow, feeble. *Antidotes*: Stimulants; amyl nitrite.

*Digitalis*: Purging; severe pain; vomit of grass-green color; pulse small, slow, irregular; headache; lethargy; delirium; spasm; dilated pupils; coma; sudden death. *Antidotes*: Emetics; tannic or gallic acids in large quantities; stimulants; rest.

*Hyoscyamus (Henbane, Hyoscin, Hyoscyamin)*: Giddiness; sense of weight in the head; loss of power; double vision; incoherence; coma. *Antidotes*: Emetics; quick purgatives.

*Nicotine (Tobacco)*: Nausea; vomit; diarrhoea; weak pulse; cold, clammy skin; pupils alternately contracted and dilated. *Antidotes*: Emetics; tannic acid; strychnine; stimulants; warmth; rest.

*Nux Vomica (Strychnine, Brucine)*: Tetanic convulsions in paroxysms; head thrown back; eyeballs bulging; pupils di-



lated ; anxious look ; pulse feeble, rapid ; respiration difficult. *Antidotes* : Emetics ; animal charcoal or tannic acid in quantity followed by emetic ; brouides and chloral ; quiet ; chloroform ; artificial respiration.

*Opium (Laudanum, Paregoric, Morphine)* : Mental excitement ; headache ; weariness ; weight in the limbs ; insensibility ; contracted pupils ; jaw drops ; respiration slow and irregular ; pulse weak. *Antidotes* : Emetics ; rousing ; cold douche ; coffee ; atropine ; artificial respiration.

Poisoning also results from tainted meat, in which putrefactive changes have occurred, producing active poisoning agents known as *ptomaines*. The symptoms are marked gastro-intestinal irritation, with vital depression. Antidotes are relieving the stomach and bowels by emetics and purgatives, irrigating the stomach, and supporting with stimulants.

There are several forms of *fungi*, that are sometimes mistaken for mushrooms and are actively poisonous. They give rise to severe gastro-intestinal irritation, nausea, vomiting, purging, heat and pain ; and result in great prostration, syncope, convulsions and coma. The antidotes are emetics and purgatives, Glauber's or Epsom salts, and stimulants.

Bites and stings of snakes and insects owe their poisonous effect to a secretion that is discharged into the wounds. Bleeding should be encouraged by the application of warm water. It is sometimes the practice to suck the wound, as the poison does not affect the unbroken mucous membrane. Ligate the limb above the bite. Pressing a piece of loaf sugar upon the wound is also recommended. For snake and insect bites ammonia is recommended to be applied to the wound and administered internally. The wound should be thoroughly cauterized and afterward poulticed.

Stings from insects can be treated in the same manner. If the sting can be seen, it should be carefully withdrawn.

Bites from dogs and cats should always be treated as though they were suffering from *rabies* (hydrophobia), as this cannot always be ascertained at the moment. They should be treated by cauterization of the wound, bearing in mind that the object in view is the removal or neutralization of the poison, and preventing it from entering the circulation.

## CHAPTER XIII.

### ASPHYXIA ; ARTIFICIAL RESPIRATION.

*Asphyxia* is the suspension of the vital functions when the lungs are deprived of air.

*Artificial respiration* is the term applied to methods for setting up respiratory action, after it has been suspended by suddenly depriving the lungs of air, as in drowning, strangulation, etc.

There are several methods, the technique of which it may be well for the student to know, but at the present time, that known as Sylvester's method is in favor and seems to be accepted as the best, although Hall's and Satterthwaite's are also effectual and have their advocates.

"Sylvester's ready method" is as follows: Place the patient upon his back, and raise the shoulders with a pad, block of wood, or anything at hand; pull the tongue forward and retain it there with a pair of forceps if they are at hand, or if not by wrapping a dry handkerchief or a piece of cloth about it, or tied to it, the ends passing to the back of the head and tied. The clothing should all be loosened. Then the operator should take a position behind the patient (kneeling), and grasp his arms at the elbows, or just below them; draw the arms steadily in an upward direction over the patient's head until the hands meet (Fig. 34). Keep

them there for two seconds. By this action the chest walls are expanded, and the interval allows the air to fill the lungs. The arms are then brought back slowly and pressed against the side of the chest with some force in order to expel the air (Fig. 35). These movements should be repeated with the frequency of normal respiration, or about sixteen times per minute. It should be continued ceaselessly until natural respiration is established, and is not to be considered hopeless under two hours. There is always a tendency in beginners

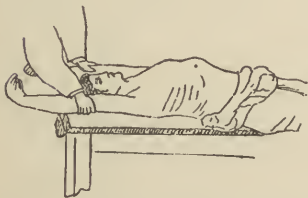


FIG. 34.—SYLVESTER'S METHOD ;  
INSPIRATION.

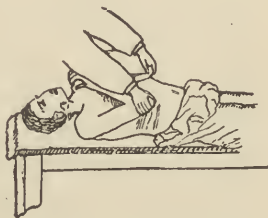


FIG. 35.—SYLVESTER'S  
METHOD ; EXPIRATION.

to work too rapidly, and therefore the movements should be timed.

*Marshall Hall's* method is to place the body on one side and alternately roll on the face and compress the chest, and then turn on the back, to allow the elastic walls of the chest to return to their normal position. These movements are repeated sixteen times to the minute. It is sometimes alternated with Sylvester's plan, but is not as complete, and therefore the latter should be depended upon. According to Sylvester's experiments, ten times more air is admitted to the chest by his method than by Hall's. In Sylvester's

method, as the arms are raised up, blowing into the mouth may be resorted to.

*Howard's* method is as follows : The patient is turned on his face, and a bundle of clothing (which is likely



FIG. 36.—HOWARD'S  
METHOD ; TO FREE THE  
LUNGS.

to be at hand) is placed beneath the stomach (Fig. 36). Pressure is brought to bear upon the spine. The patient is then rolled upon his back, and the bundle is placed beneath, opposite the stomach. The mouth is then opened and the tongue drawn out of the corner of the

mouth ; the arms are raised above the head. The operator then kneels beside the patient or astride his hips, and with the balls of his thumbs resting upon either side of the pit of the stomach, his fingers fall into the grooves between the short ribs and allow him to grasp the waist ; using his knees as a pivot, he throws his weight forward on his hands, at the same time closing them, and lets go suddenly. He rests a few seconds and repeats. This requires two operators, although it is probably more effectual than either of the former methods. It is particularly adapted to cases of drowning.

In a person who appears to be *drowned*, there must be an effort to free the lungs of water at once. To do this effectively, roll the body over on the face, which should be lower than the body. If there is a shelving bank, have the heels at the high part of it. Then pry the mouth open and keep it so with a piece of wood or knot of a handkerchief. Clean out any accumulation of mucus in the mouth or throat with the finger. The

tongue also should be depressed. Then, getting astride of the patient, press with the flat of the hand upon the abdomen, so as to push up the diaphragm. In half a minute, or perhaps less, the water will be driven out sufficiently to allow efforts at artificial respiration to be made.

Warm and dry coverings are important, and the wet clothing must be removed ; either build a fire or send for hot water ; warm blankets to wrap around the body, and heat metals, stones, or hot water in bottles, to place along the trunk and to the lower extremity. Friction should also be applied, and ammonia held to the nostrils. When the respiration and circulation have been re-established, the patient should be taken to some quiet place, and beef-tea, broths, and wine should be given. Instances of resuscitation are recorded which are remarkable.<sup>1</sup>

The other modes of death by asphyxia besides submersion, are strangulation and confinement in close rooms. In cases of *strangulation* (hanging, garroting), the body should be cut down, and not be allowed to fall. If by listening to the heart there is any trace of action, attempts to restore animation have some chance of success. It is doubtful whether life is ever recalled after stoppage of the heart following asphyxia. A rectal temperature of 80° F. is also a certain proof of death. If dropping hot sealing-wax upon the skin produces no redness, it is a further sure proof of death. Another proof is tying a string around the finger, and if no change of color appears, and after

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<sup>1</sup> A case is reported (*Lancet*, 1840), in which an infant was resuscitated after being submerged for ten minutes. A French lad at Oleron was brought to life after being in the water for nearly an hour.

removal of the string the string-furrow does not color red again but remains white, death is positive.

The trachea may be obstructed by the entrance of a foreign body that cannot be dislodged by coughing. When this occurs, it is usually in the case of children. Sometimes a violent slap on the back will dislodge it, or, in the case of a child, it can be taken by the feet and held head downward while blows are administered between the shoulders.

Mechanical obstacles to respiration may also be caused by a polypus, by œdema of the glottis, or by an abscess of the pharynx or the tonsils. These call for the surgeon's interference.

The fumes of burning *charcoal* (carbonic oxide) are sometimes used as a means of self-destruction. The patient must be treated the same as for asphyxia from other causes.

In the case of the insane, large pieces of food sometimes fasten in the gullet or pharynx, and shut off the air passages. It requires rapid action on the part of the nurse, as relief must be afforded before the doctor can arrive. Usually, this accident occurs in the case of general paralytics, who gulp their food, and in these cases care should be exercised to have the food finely divided, or soft enough to break up in passing the œsophagus. Frequently, by slipping the index finger in the side of the mouth and over the tongue, protecting it by a towel put between the teeth on the other side, the obstruction can be hooked out, or pushed down far enough to allow air into the larynx. In making the call for the physician, state the trouble, so that he may take the necessary instruments with him, and thus save time. When the substance is

lodged in the gullet, it may be forced down with the ordinary feeding tube.

In the case of children who have foreign substances lodged in the air or food passages, the involuntary retching is assisted by putting the finger in the pharynx. By vomiting and coughing united, such substances are usually ejected, even from the trachea. If it is in the œsophagus, by swallowing a piece of dry bread it is usually carried down. No alarm need be felt in allowing indigestible articles to pass into the stomach, as they very easily pass the intestines. It is well to follow the swallowing of coins, buttons, etc., with a dose of castor oil, but do not give an active purgative.

Foreign bodies lodged in the *eye* occasion intense pain. The irritation leads to increased secretion of the lachrymal gland, and this has a tendency to flood it out. Lift the lid upon which the matter is felt and draw it over the other, allowing it to return slowly, when the foreign matter may be wiped out; or the better way is to see the offending particle and wipe it out with a clean handkerchief. Lift the lids and ascertain if it is on the eyeball. If it is on the upper lid take a knitting-needle, toothpick, or other small article and turn the lid over it, when the conjunctiva will be exposed and the particle can be carefully wiped off. If it is a piece of iron or steel, an ordinary magnet will draw it out. If lime gets in the eye, drop in a very weak solution of acid, lemon juice, or vinegar. After any irritation to the eye, drop in a solution of boric acid. A one per cent. solution of cocaine will relieve the pain for a while, and in children is sometimes necessary in order to extract a foreign substance.



Foreign bodies in the *ear* are sometimes troublesome and difficult to extract; particularly seeds, such as beans and peas, as they swell when moistened and fill the passage tightly. These are usually cases for the surgeon. If a surgeon is not within call, make a little hook with a wire or hairpin and very carefully work it behind the article. If the article is small, or an insect, gently syringing out the ear may suffice; or a piece of absorbent cotton saturated with a strong solution of salt and vinegar, pressed in the ear and left there for a while and withdrawn, may bring the insect with it. Remember the delicate construction of the tympanum and the ease with which it may be permanently injured. *Earache* in children is a troublesome symptom and one sometimes quite difficult to relieve. Heat applied by poultices or dry fomentations is sometimes effectual. Dropping in the ear equal parts of warm olive oil and laudanum is an old remedy, or putting a pledget of absorbent cotton in the bowl of a clay pipe, dropping a little chloroform upon it, and blowing the vapor into the ear through the stem will sometimes relieve it.

Foreign bodies in the *nose* are usually accidents with children who attempt to stick up small marbles, or grain and seeds. Blow the nose; give a pinch of snuff to produce sneezing; take a full breath, close the mouth and the other nostril; or hook it out with a hairpin.

Sometimes a needle breaks off in the skin. It should be cut down upon at once and removed, or it will work deeper in a short time.

## CHAPTER XIV.

### CONVULSIONS, APOPLEXY, COMA, SYNCOPE, ETC.

A *convulsion* is a paroxysm of involuntary muscular contraction, either tonic or clonic, and usually attended by loss of consciousness.

It may be due to epilepsy, catalepsy, hysteria, chorea, or other functional or organic disease of the brain. *Infantile* convulsions are due to reflex causes, such as indigestion, worms, the onset of disease, rickets, etc. During infancy, causes which in an adult would cause delirium produce convulsions. They occur chiefly in the first year. *Puerperal* convulsions accompany the puerperal state. *Uræmic* convulsions are due to the poisoned state of the blood in kidney disease.

Children's fits usually cause great alarm to the members of the family, but the nurse should recollect that they are seldom fatal, and are usually self-limited—that is, will cease after a time. The exciting causes are very numerous. Constipation, irritation of the gums in teething, excitement or shock, such as fright, are frequent causes. Sudden drying up or disappearance of an eruption may be succeeded by a fit. Premonition of a fit may be observed in a child's restlessness or gritting of the teeth. When a fit comes on, the muscles of the face twitch, the body becomes rigid and

then jerks, the head is thrown backward. Sometimes these movements are confined to one side. In some cases the limbs move but little, but the eyes roll and the body is stiff. These are popularly known as "inward fits." The eye shows no sign of sight; the pupil is immovable; pulse is small and frequent; breathing is hurried; skin is cold and clammy. After this condition has lasted a few minutes, it gives way to a natural and quiet sleep. Sometimes one fit follows another with a short interval between for many hours, and these are the most serious cases.

In the absence of the physician, the nurse should ascertain, if possible, the cause of the convulsion. If it is due to over-eating, which is frequently the case, an emetic should be given, and this should be followed by an enema. In the absence of ipecac, hot water with a little mustard will relieve the stomach. If it be due to constipation, or if the bowels are swollen and tense, give an enema of castor oil, soap, or molasses. A warm bath should be prepared at once at a temperature of 100° F. The head should be held up, and at the same time a cold compress should be applied to it. Mustard poultices can be applied to the back of the neck, over the abdomen, or to the feet.

Convulsions in *adults* are usually from epilepsy or hysteria. An epileptic seizure is distinguished by a sudden fall and clonic convulsions, or jerking, which follow, and unconsciousness. Foaming at the mouth, grinding of the teeth, and biting of the tongue are common. The fit lasts on an average from five to ten minutes. After the fit sleep may ensue, or the patient may wander about in a confused way. Sometimes the fit is succeeded by violent mania. The patient is usu-

ally not conscious during the confused or excited state that follows a fit.

*Epilepsy* can be distinguished from syncope by the jerking movements; from hysteria, by the fact that in the latter consciousness is usually retained. The only treatment during the fit is to keep the patient from doing himself an injury. Lay the head on a pillow, loosen the clothing, particularly around the neck, and give plenty of fresh air. Arrange him so that during the convulsive movements he will not strike anything hard. If he has a tendency to bite the tongue, place a folded handkerchief between the teeth. There is a popular tendency to give a patient in a fit something to drink, but this should not be allowed. Premonition of an attack occurs in some cases by a feeling of dizziness, spectral illusions, or a crawling sensation of the skin. These are called *auræ*. When they begin at the extremities, a ligature applied above the point of sensation is said to control the fit. When a maniacal attack follows a convulsion, the best treatment is to place the patient where other persons are not seen, or in seclusion; but not wholly so, for the patient should be kept under observation. In the confirmed epileptic, careful attention should be given to the bowels, the diet should be plain, and there should be abundant exercise in the open air.

*Hysterical* fits usually occur in young girls, and sometimes resemble epilepsy. There is not unconsciousness, however, and they avoid doing themselves any injury. Avoid any sympathetic expression. The suggestion of a cold douche is sometimes curative.

*Catalepsy* is marked by unconsciousness and a fixed rigidity of the body. It is a rare disease.

*Uræmic* convulsions do not differ materially from epilepsy. A hot pack to start perspiration frequently relieves the fit.

The word *apoplexy* literally means a knocking down or stunning. Any condition resulting in a sudden loss of consciousness and of motion, especially as the result of hæmorrhage into the brain, is known as apoplexy. As a rule, there is no premonition of apoplexy. The attack often begins during sleep, the patient going to bed in the usual condition. When it occurs during the waking state, the attack begins quite suddenly, the patient falling to the ground unconscious. The face is livid; the cheeks flaccid and flapping loosely with the respiration; the pulse is slow, full, and hard, and the pulsation can be seen in the neck; respiration is slow and labored, and if there be Cheyne-Stokes breathing the case is unfavorable; the temperature is normal at first, but rapidly rises.

The coma<sup>1</sup> of apoplexy must be distinguished from coma resulting from a variety of causes. There is one common symptom in coma, and that is loss of sensation. Other symptoms vary, and it is possible to distinguish the cause. Thus in *alcoholic* coma, or complete intoxication, the odor of the breath is very noticeable; the pulse has not the full character of apoplexy; there may be snoring, but not the peculiar stertorous breathing; the pupils are dilated.

In *opium* poisoning, the odor of the drug can be detected; the pupils are tightly contracted (pinhole); the face is pale, ghastly, and the breathing is slow.

In *diabetes*, coma sets in very suddenly, without warn-

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<sup>1</sup>Coma is the condition in which there is complete absence of conscious sensation. It is a morbid sleep.

ing. In these cases the breathing is characteristic ; it is very labored and expiration is accompanied with a groan ; the pulse is small, weak, and rapid—from 120 to 140 ; the temperature is usually subnormal, and the extremities are cold.

In *uræmia* the coma always succeeds a convulsion. If the latter has not been seen, it is very difficult to distinguish this form from cerebral apoplexy.

The treatment of a patient in an apoplectic fit should be to loosen all tight clothing, especially about the neck, and raise the head and shoulders. Cold applications can be made to the head, and counter-irritants applied to the extremities. Stimulants must not be given. Keep the room cool, dark, and quiet. In all forms of coma keep the head cool and the extremities warm, and call a physician. This is the extent of treatment to be rendered by a nurse. In apparent intoxication it must be borne in mind that apoplexy may have supervened upon a debauch, and an alcoholic breath should not preclude the ordinary treatment of insensible persons. It is better to be on the safe side.

*Syncope* is a condition of swooning or fainting, resulting from a partial or complete suspension of respiration and circulation. It follows a deficiency of blood supply to the brain, and, as a rule, comes on suddenly. It occurs in every degree from vertigo, or dizziness, to profound unconsciousness. It may be caused by a close room, tight lacing, fright, bad news, etc. There is first a giddiness, the face becomes very pale, the lips are bloodless, and the patient becomes unconscious.

The first and important thing to do is to lay the patient with the head as low as or lower than the body. Recollect the cause of the fainting, and the remedy will

suggest itself. Loosen the clothing and allow plenty of fresh air, or assist the movement of air by fanning. Smelling salts or ammonia held to the nose,<sup>1</sup> or a sprinkling of cold water over the face, may excite respiration.

*Sunstroke*, *heat-stroke* or *insolation*, is a nervous affection characterized by syncope and enfeebled respiration and circulation, caused by exposure to great heat. Direct exposure to the rays of the sun is not essential, but it is caused by a continuous high temperature. Any condition that enfeebles the vitality predisposes to it; thus fatigue, poor living, the alcoholic habit, etc., are predisposing causes. One attack creates a tendency to another. There are two forms of sunstroke, one with an elevated and one with a subnormal temperature. The former is called *thermic* fever, and the temperature sometimes reaches 108° F., or even higher. In these cases there is unconsciousness, the face is flushed, and the breathing is laborious.

The immediate treatment of a case of sunstroke is to remove the outer clothing, lay the patient down with head and shoulders raised, and administer liberal cold douches or apply ice-bags to the head. Where it is available, the temperature can be lowered by cold-tub bathing, at the same time applying cold to the head. Sponging with ice-water or even rubbing the body with ice is admissible. If respiration ceases, or becomes so slow as not to oxygenate the blood, artificial respiration can be resorted to. Where there is a subnormal temperature, with great exhaustion, stimulants must be freely administered.

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<sup>1</sup> Care should be taken that *strong* ammonia be not held to the nose.



The *lightning* stroke is a discharge of electricity of high potential, and when it passes through the body, usually results in death. Sometimes the nervous shock causes dangerous syncope. In all cases artificial respiration should be resorted to until all hope of resuscitation is gone.

Exposure to severe cold results in death or freezing of parts of the body (frost-bite). The patient suffering from frost-bite must not be exposed to heat, as the sudden reaction might result in the sloughing of the frozen part. The patient should be taken to a cold room, undressed, and rubbed with snow or very cold water. Friction is important, and it should be continued until circulation is established in the part. If respiration has ceased, the artificial method should be resorted to. Stimulants should be given as soon as the patient can swallow, but in moderate amount.

*Chilblains* are a local inflammation and swelling of the skin due to cold. They are very painful and irritating, especially in bed at night. A tepid foot- or hand-bath used every evening, in which from one to two tablespoonfuls of nitric acid have been added, has a soothing effect. Painting them with iodine relieves the itching. Parts with chilblains should not be warmed quickly if cold. They should always be warmly covered.



## CHAPTER XV.

### NERVOUS DISEASES.

THE word *paralysis* (or *palsy*) is used to signify loss of nerve function, either of motion or of sensation. Paralysis may be partial or complete. Paralysis is *functional* when there is no apparent disease of the nerve centres. This is the case in *hysterical* paralysis. The detection of hysterical palsy is sometimes quite difficult. It is usually indicated when the bladder, intestines, or rectum, or any organ closely related to the sympathetic nervous system, is paralyzed. It is also apt to be shifting in its nature and transient; but hysteria often closely simulates organic disease. It is the functional paralyses that enter into the mind cures, laying on of hands, etc., and illustrates the close relation of mind and body function.

A *hemiplegia* is a paralysis that affects one side of the body. It may occur suddenly, by apoplexy, or come on gradually, and when sudden, is due to a hæmorrhage into the brain, or to arrest of the brain circulation by thrombi or emboli. When it comes on gradually, it may be due to an abscess, tumor, or other brain disease. If the paralysis is organic, it is possible to give the location of the disease by the symptoms presented. Hemiplegia may be hysterical.

*Paraplegia* is a paralysis of the lower limbs, and when organic is due to hæmorrhage into or disease of the spinal cord. When it comes on suddenly and the patient falls to the ground, it is termed *spinal apoplexy*. Sometimes consciousness is lost and it then appears like a true apoplexy. Usually paraplegia does not occur suddenly, and frequently it requires months for it to develop. Inflammation of the membranes of the spinal cord or disease of the vertebra gives rise to paraplegia.

A *monoplegia* is a paralysis of one extremity. It is sometimes caused by pressure upon the nerve supplying the limb. *Multiple* palsy is where several groups of muscles are affected. In diphtheria there is this form of paralysis occasionally occurring within three weeks of the beginning of the disease. It usually affects first the muscles of the throat and voice, next the eyes, legs, etc. In the majority of cases it is recovered from.

*Local* paralysis may affect any muscle, and may be due to various causes, disease of the nerve, or pressure by tumors, etc.

Convulsions, spasms, tremors, and all motor excitements, are due to disease of the nervous system, either functional or organic.

*Contractures* are shortening of muscles due to nervous disease and frequently follow paralysis. They result in more or less deformity. There are also hysterical contractures in which there are no organic disease. These are sometimes very persistent and last for years. A peculiar disease, in which muscular control is lost, is called *Thompsons's* disease. When the patient attempts to do anything, the muscles become stiff and remain so for several minutes.

*Co-ordination* is that function of the nervous system which causes all the muscles to act in harmony with each other under the control of the will. In certain diseases of the nervous centres this function is lost, without any loss of muscular power. This is the case in *locomotor ataxia (tabes dorsalis)*, which is a common disease of the posterior columns of the spinal cord. This disease is characterized by a peculiar kicking walk known as the *ataxic gait*. If the eyes are closed, the patient falls to the ground. Later in the disease, the patient loses the power to walk, and entire control of the legs. In general paralysis co-ordination is affected. In disease of the cerebellum it is also impaired to such an extent as to interfere with walking. The walk of the patient resembles that of a drunken man.

*Vertigo* is a sensation of motion of all surrounding objects. It may be a slight dizziness only, or to an extent where everything seems to be whirling about wildly. It is the feeling that usually precedes syncope. The sensations of rising or falling are of a similar nature. When functional, it is usually relieved by sitting upright or by changing the position. Vertigo is a symptom of many nervous diseases. Gastric vertigo results from indigestion and is peculiar to some individuals after eating strawberries, lobster, or shell-fish; sometimes it is accompanied with headache. *Aural* vertigo is caused by disease in the semicircular canals (of the ear). Throwing a jet of cold water into the ear will cause vertigo. Vertigo is also a common symptom of poisoning. The movements of surrounding objects that appear to an intoxicated person is an instance.

*Trophic lesions* are the changes of bodily tissue that

are dependent upon diseases of the nervous system. The most notable example of trophic disturbance is the bed-sore (decubitus). It occurs both in disease of the brain and spinal cord. The *perforating* ulcer is another variety. This is a peculiar ulcer which usually appears on the foot, and usually affects the big toe. The first symptom is a severe pain ; a small spot appears upon the skin and soon a slough appears which may reach to the bone. It occurs in locomotor ataxia and other nervous diseases.

It is now believed that many diseases of the skin are trophic lesions, or really nervous diseases or symptoms of them ; thus herpes, or shingles, and neuralgia seem to be connected. Also, changes in the hair and nails are due to the same cause, as well as changes in the bones.<sup>1</sup> Changes in muscles and joints due to nervous disease are very frequent. In infantile paralysis the growth of a limb is sometimes checked, resulting in a permanent deformity.

A paralysis may affect only the sensory nerves, and it is then called *sensory paralysis*. In gross lesions of the brain and spinal cord, both sensation and motion are affected. When cutaneous sensation is completely lost, it is called anæsthesia ; but the sense of heat and cold, or of pressure, may be lost without affecting general sensibility. There may be a loss of sensation of one side of the body, which is called *hemi-anæsthesia*. Rectal and bladder paralyses are important, as they lead to retention, which may be very serious. Anæsthesia is often hysterical.

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<sup>1</sup>The bones of insane patients frequently become brittle and soft. They are therefore liable to fracture. This is especially true in general paralysis.

Increase of sensation is called *hyperæsthesia*, and is usually hysterical in its nature. The hysterical breast is an instance ; it is characterized by great pain and tenderness upon pressure, pain frequently extending down the arms ; considerable swelling occurs, so that it is often mistaken for a tumor. The larger joints, and particularly the knee, are subject to swelling and pain which appear like an inflammation, but are simply nervous. These are called hysterical joints. Spinal irritation, in which there is a point of the spinal column extremely tender upon pressure, is a very common hyperæsthesia.

A serious nervous disease is inflammation of the nerve trunks, called *multiple neuritis*. In a large proportion of the cases it follows exposure, especially after great physical exertion. It is frequent in persons who use alcohol to excess, and sometimes follows infectious diseases. Neuritis may cause paralysis of the parts supplied by the inflamed nerves, or result in serious trophic changes, especially of the muscles. It may prove fatal in a few days, and if recovery occurs there may be a permanent defect in the muscles affected. The symptoms of neuritis very often resemble the symptoms of disease of the brain or spinal cord.

In all cases of nervous disease, very close observation is necessary to distinguish the various symptoms upon which diagnosis of the disease depends. Changes from health in sensation and motion, with accurate location of these changes, are important, and their detection very often depends upon the nurse. No symptom should be neglected under the belief that it is unimportant ; it may have the greatest significance. Sensory symptoms are subjective, and a knowledge of them depends upon

expressions of the patient, who is likely to give a more accurate description to the nurse, than during the excitement of the doctor's visit. All of them, however slight, should be recorded.

A disease, or, more properly speaking, a condition of the nervous system first recognized and named but twenty-five years ago, is called *neurasthenia*. It is essentially *nervous exhaustion*, and is associated with many other diseases. Nearly all the acute insanities are preceded by neurasthenia, and if the exhaustion does not lead to a complete break-down, or explosion, into an attack of mania or melancholia, it leaves the patient a nervous invalid with a variety of distressing symptoms.

There is no doubt that neurasthenia is the most frequent nervous disease or morbid nervous condition. Its characteristic signs are irritability, weakened mental control, and depression of feeling. Fatigue is a prominent symptom; not the wholesome tired feeling after prolonged exertion, but a feeling of tire at all times, inability to control the attention, a feeling of ill-being, a tendency to worry and fret over trifles, irritability of temper, and change in the disposition. The nurse should be able to recognize symptoms of neurasthenia, either as a condition alone or in combination with other diseases. The neurasthenic must be treated with great gentleness and forbearance, for, like all morbid impulses, the vagaries and imperative notions are symptoms of a morbid state, for which the patient is not responsible.

*Neurasthenia* is properly divided into the *cerebral* form, the *spinal* form, the *visceral* forms, and *sexual* neurasthenia. It depends very largely upon the in-

heritance of a weak nervous system, which gives way to any unusual strain. As exciting causes these are all that enter into causes of insanity, or other nervous disease, and the nervous exhaustion may be produced slowly or suddenly by them.

The symptoms of neurasthenia cover the whole field of nervous symptoms, but there are some that are peculiar to it. A sensation of emptiness of the head; difficulty of thinking or fastening the attention; a feeling of muscular fatigue without adequate cause, and points of tenderness along the spine, are the most prominent.

In *cerebral* neurasthenia we have the typical borderland between sanity and insanity. With all the peculiar acts, impulses, and ideas of a neurasthenic, there remains the capacity to reason. It is therefore sometimes called lucid insanity, reasoning mania, insanity with consciousness, etc. Neurasthenics are also subject to various nervous disorders, neuralgia, migraine, palpitations, dyspepsia, cramps, spasms, etc. Another difference is presented between neurasthenia and insanity, in the fact that the former never terminates in dementia.

A very distressing form of neurasthenia is the impulsive form, or that form in which the will has lost its power. The mind becomes filled with an idea that cannot be eliminated. This is a *fixed idea*. It may be a doubt, in which patients hesitate about every act, and their entire time is taken up with doubts, hesitations, and indecisions. They hesitate whether to start a walk with the left or right foot, whether to look one way or another, etc. Another will count everything, the trees, gas-burners, figures on the wall paper, etc. The fear



of objects is another form which is sometimes called the insanity of fear. This is also a fixed idea accompanied with an anxious dread. Some classifications of insanity give each separate symptom a name; thus the fear of dirt, mysophobia; the fear of pointed objects, belonephobia, etc. Fear of places and of height are quite common forms.

The treatment of neurasthenia is complex and prolonged. In no disease is good nursing of greater importance. Medicinal treatment is of very little use except to correct visceral disorders and to improve the condition of the blood. Bathing of all sorts, massage, passive movements, and electricity are agents of value in treatment. The vascular and sensory disorders must be treated as they arise, and symptoms as a rule govern the treatment, although the pathological condition is substantially the same. It must be recollected that it is a nervous exhaustion, and this alone suggests the treatment. There is a treatment known as the *rest-cure*, in which the patient is placed in bed for weeks and is not permitted to rise. During this time the patient is fed liberally, and the evils of the continued recumbent posture are neutralized by massage and electricity. Change of scene, removal from all sources of anxiety and worry, and mental diversion of all kinds are important factors of treatment.



## CHAPTER XVI.

### INSANITY.

*Insanity* is a symptom of a disordered bodily state characterized by derangement of the mental faculties. It is not a disease in itself, but a symptom of disease. Nearly every acute disease occasions during its course some modification or derangement of the mental faculties, such as delirium in fevers, etc. If the disease is situated in the nervous centres, particularly in the brain, then the mind is always more or less deranged.

If the disease affecting the brain changes the relations of its minute elements (cells or fibres), then the derangement is more or less permanent, and its degree depends upon the extent of the brain disorder. Therefore, let all your former notions of insanity give place to this rational consideration of it.

The mental faculties—*feeling, knowing, willing*—are the functions of the brain, as much as digestion is a function of the stomach or excretion a function of the kidney. These functions may be disordered by some remote influences through the sympathetic nervous system, without physical change in the brain itself, and this is called reflex derangement of the mind.<sup>1</sup> The

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<sup>1</sup> The teacher should give illustrations of morbid bodily conditions reflexly disturbing the mind.

organs of the body are intimately united through the nervous system, and a disease of one organ may occasion a disturbance of the functions of another. This is plainly shown in the melancholy frame of mind that accompanies torpidity of the liver, which we speak of as "the blues."

Thus many diseases of a part or parts of the body can reflexly irritate the brain so as to derange its functions, and if this is continued sufficiently long, the brain becomes disordered and the mental derangement becomes permanent.

The mass of insane persons, however, are insane because of some disturbance of the brain elements, caused chiefly by a lack of proper nutrition to the brain-cells, either from a change in the vessels supplying the blood (nutritive fluid), or some detrimental change in the character of the blood itself. Poisons in the blood promptly affect the brain-cells and either destroy or modify their functions. This is shown in the mental condition produced by many chemical poisons. The haschisch or opium eater produces a temporary insanity by poisoning the brain-cells. If this condition were permanent or prolonged, it would be called insanity. Hence, derangement of the mind that is of short duration is not classed as insanity.

Insanity was formerly regarded as demoniacal possession.<sup>1</sup> It is only during the past century that insanity has been regarded as a physical disease, or

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<sup>1</sup> Before Hippocrates, insanity was considered as coming from the gods, and its treatment was confided to the priests. For a period about 400 B.C., known as the Hippocratic period, there were enlightened views of insanity held by physicians, but from the beginning of the Christian era down to nearly the end of the last century there was a return to the primitive superstitions.

that enlightened views as to its nature have been held, and rational treatment has been practised. In fact, during the past fifty years the advance in the care and treatment of the insane has been greater than for two thousand years previously.

For the sake of convenience, insanity is considered in the light of a disease, and is classified according to the symptoms presented, or according to the cause of the insanity. There is no uniform classification—some basing it upon symptoms, which is called a *symptomatic* classification ; and others upon causes, which is termed an *etiological* classification. An effort has been made to make a classification based upon the disease itself, of which insanity is a symptom, but without success.

The simplest classification is the one now in general use, and is as follows :

*Mania.*

- Subacute
- Acute
- Hyperacute
- Delirious
- Chronic
- Recurrent.

*Melancholia.*

- Subacute
- Acute
- Hyperacute
- Delirious
- Chronic
- Recurrent.

*Alternating insanity* (circular insanity).

*Paranoia* (systematized insanity).

*General paralysis* (paresis, paralytic insanity).

*Toxic insanity* (insanity from poisons).

*Moral insanity* (impulsive or volitional insanity).

*Idiocy or imbecility*.

The causes of insanity are divided into (1) predisposing and (2) exciting causes. The *predisposing* causes are those which make persons susceptible to any unusual strain of mind or body, and render them unable to withstand unusual conditions. Among predisposing causes are :

(1) *Civilization* ; the push and constant tension that result from competition, and the many demands of an advanced civilization, exhaust the nervous energy.

(2) *Heredity* ; the defects of constitution are inherited ; and in more than one-half of those becoming insane there is a history of defective parentage. Heredity of itself is not the cause of insanity, but it is the inherited weakened constitution that cannot resist a strain which predisposes to insanity.

(3) *Age* ; the period of puberty (between fourteen and eighteen years) and of the climacteric (between forty and fifty years) are times when any unusual strain is more likely to result in a break-down.

(4) *Sex* ; women are subjected to more exciting causes ; and certain mental disorders, like those connected with pregnancy, are peculiar to women. General statistics show, however, that the male sex figures more largely than the female in insanity.

(5) *Civil condition* ; statistics show that insanity is more frequent in the unmarried than in the married, but this is partly explained by the reluctance of persons to marry who are disposed to insanity.

(6) *Education* ; a vicious education and one that is

pushed beyond the natural capacity of the child tends to weaken the mental faculties.

The occasional causes, usually of a moral or emotional nature, that tend to insanity are innumerable. Terror, moral shock, loss of near friends or property, domestic troubles, etc., all have an effect in unbalancing the mind.

Of *physical* causes, those that are direct or local are injuries to the head, sunstroke, tumors of the brain, etc. ; and the sympathetic causes are usually diseases of the abdominal organs. Anæmia, or a poor condition of the blood, certain diseases, such as fevers and particularly influenza, are frequent causes. Syphilis is a frequent cause of insanity.

Insanity is a disease that does not run its course rapidly ; except in acute delirious mania. It is rare that acute insanity is recovered from under one month. Usually recovery takes place, if it occurs at all, between the second and twelfth month. It is considered that insanity lasting more than one year is chronic, but there are so many exceptions that the rule has but little force.

Insanity may *begin* in a slow and progressive manner, or may break out suddenly. It is nearly always preceded by a period of depression and ill-feeling, and whether the subsequent character of the insanity be that of excitement or depression, this preceding period is always one of depression.

The *symptoms* of insanity should be known by the nurse, so that they can be recognized when seen and properly reported. The proper division of symptoms is into :

(1) Functional symptoms.

(2) Organic or constitutional symptoms.

The *functional* symptoms are those of general activity, the actions of the insane, or the disturbances of the special senses and intellect. The most prominent symptom, in nearly every case of acute insanity, is either excitement or exaltation of the feelings above that in health ; or depression of the activities or feelings.

*Excitement* means an increase in action, beyond the control of the will, and is expressed by movements of the body and rapid speech. It is the chief symptom in mania. We call all conditions in which the bodily activity and exaltation of mind are greater than in health, maniacal.

*Depression* is the opposite condition to excitement. There is more or less stupor and the bodily action is suppressed. It is the chief symptom in melancholia.

The *intellectual* disorders are *delusions*, *hallucinations*, and *illusions*.

A *delusion* of the insane is a false belief, and is usually absurd. Sometimes they are not absurd and it is difficult to distinguish them, hence a delusion should never be reported as such until it is shown to be without foundation. Sometimes great injustice is done to insane persons by classing as delusions true statements. There are as many classes of delusions as there are manifestations of thought ; thus, there may be delusions of grandeur, of humility, and despair, of persecution, of religion, of bodily transformation, etc. It must not be forgotten that delusion does not constitute insanity, but is only one of its many symptoms. There may be insanity without delusion, as in moral or impulsive insanity.

*Hallucination* is the sensation of perceiving without

an object ; thus, if a voice is heard when no sound strikes the ear, if a horse is seen when there is no object in view, if there is a specific taste when nothing is taken into the mouth, they are hallucinations. There are as many varieties of hallucinations as there are senses : of sight, hearing, smell, taste and action. Then there are hallucinations that do not involve the senses, as when a patient converses with the Deity, etc. There may be hallucinations without insanity—especially in the state between sleeping and waking.

The most common hallucinations are those of hearing, and these are unfavorable symptoms. They are also dangerous symptoms, and patients with hallucinations of hearing should be watched with care. They are often accompanied by delusions of persecution, and patients hear their enemies threatening, etc. The hallucination of hearing is usually in the form of a voice. It may be music, groaning, crying, etc. The voices may be of a pleasant character, but they are more frequently distressing. What is known as the *thought echo*, is the repeating aloud of the thoughts of patients, and their most secret acts. Sometimes patients in explanation of their hallucinations ascribe them to natural causes, as the telephone, etc. The language is sometimes in an unknown tongue. A nurse should report all the characteristics of a hallucination, as it may have a valuable bearing as a symptom.

Hallucinations of sight are less common than hearing and are not as serious. They are sometimes terrifying but are also pleasant in character.

Hallucinations of *smell and taste* are the most infrequent. They are met with in melancholia and in delusions of persecution where they are frequently



combined with delusions of poison in food. Sometimes they smell themselves, and on account of the foul odor they believe they give out they seek seclusion.

General sensibility, or touch, is frequently disordered, and hallucinations of this sense are associated with delusions of persecution. Electric shocks, being lifted in the air, application of powders to the skin, are instances.

An *illusion* is a mistaken perception. If a person hears the clock strike and fancies it is some one speaking, it is an illusion. Mistaken identity comes under this class. It is a common symptom in insanity.

Internal illusions give rise to delusions that are known as delusions with a *physical basis*. They are created by some sensation of an internal organ that may be diseased; thus a tumor of the uterus may lead to the belief of pregnancy, a chronic gastritis to the belief of a snake in the stomach, etc. It is important for the nurse to recognize illusions and to distinguish them from hallucinations, as they have a clinical importance.

The *emotions*, or *feeling*, is a division of the mind as frequently invaded as the intellect. *Self* (egoism) in melancholia, to the exclusion of every other consideration, is the prominent characteristic. Prodigal and generous impulses characterize general paralysis. Anxiety, contrition, and terror are symptoms of melancholia. The feelings of the patient give the special character to the disease, and are the important subjective symptoms.

Insane *actions* are innumerable and usually denote the form of insanity. In acute mania they are usually absurd, but in the milder forms of insanity they are not ridiculous, and must be carefully studied to ascer-



tain their morbid character. Acts of obscenity and filthiness are usually seen in dementia ; acts of violence and destructiveness, in mania and epilepsy ; refusal of food and suicide, in melancholia.

An insane *impulse* is the tendency to act, uncontrolled by the will. Impulsive insanity is the most dangerous form, and the one responsible for many homicides.

The physical disorders of insanity are those that principally affect sleep, sensibility, and motion.

Sleep is quite constantly affected in insanity. Disordered sleep is frequently one of the first symptoms to appear. The sleep is often disturbed by dreams and terror. Also, when the return of sound sleep appears, it is usually a sign of approaching recovery. The duration and quality of sleep are therefore important symptoms to report in acute cases. Sometimes insane patients apparently pass weeks without sleep. This prolonged insomnia is an unfavorable sign.

General sensibility is very often altered in very great degree in insanity. There may be complete anæsthesia, so that wounds or operations are unfelt. In those cases where patients mutilate themselves this condition usually prevails. There is oftener anæsthesia than hyperæsthesia, although the latter is an occasional symptom of mania. It, like the former, may be limited to parts of the body. Sometimes there is insensibility to pain without disorder of touch ; or heat and cold cannot be distinguished although pain is felt. The nurse should make all these distinctions in her observations.

The *special senses* may all, or each, either be increased, diminished, or abolished. Nearly all the peculiar acts of the insane in which the special senses

are involved are connected with some change in their functions ; thus, a patient eating with apparent relish the most bitter herbs, will be found to have the sense of taste abolished, etc.

All possible lesions of motion (motility) are observed in insanity. The muscles may be flaccid, relaxed, in a state of tension, atrophied, etc. The *attitude* of an insane person is not always governed by delusion or impulse. Some muscular reason may exist for it. These disorders are also frequently connected with some complications of spinal disease. Some of the disorders of motility are paralysis, spasms, cramps, grinding of the teeth, tremors or tremulousness, inco-ordination, catalepsy, tetany, rigidity, and alteration of the voice.

The *circulation*, *nutrition* and *assimilation*, *respiration*, *secretion*, and *temperature*, may be all or in part modified by insanity.

## CHAPTER XVII.

### FORMS OF INSANITY.

TAKING the classification given in the previous chapter, *mania*, the first mentioned form, is the more frequent one. It is characterized by active excitement and exaltation, and usually indicates pleasurable sensations. There is a constant desire for movement. An attack of mania is divided into three periods, viz., one of invasion, one of culmination, and one of termination.

When a person succumbs to an attack of insanity, it may take the form of excitement or depression ; that is, of mania or melancholia. Usually, however, mania attacks young persons and persons of excitable temperament. Young women are more subject to mania than to melancholia. It appears also to be the more frequent form in the spring and summer.

Before an attack of mania is established, there is a period of depression and "nervousness," with uncomfortable feelings, sleeplessness, headache, loss of appetite, and constipation. This may be of variable duration. As it disappears, the patient feels much better ; as the feeling of well-being increases, the excitement comes on ; the will is given over to impulse ; the mind is without a bridle ; thought is so rapid that speech cannot utter it ; there are outbreaks of passion

followed by a wallowing of affection, and all connection of acts and thought is destroyed. There is a tendency to excesses of every kind. Sometimes these excesses are supposed to be the cause of the disease, when they are merely the earliest symptoms.

Before control of action is lost, the patient has the tendency to act, but is capable of restraining himself. This accounts for the sudden outbreaks. Control is lost suddenly, and the desires previously existing then go unchecked. The same thing occurs as the patient begins to improve. The power to restrain acts is regained, and it may be noticed in any case of mania on the road to recovery, that occasionally for a short time control is lost and there is a maniacal outbreak.

Sometimes the stage of invasion is very short, and the attack reaches its full intensity at the very first; generally, however, it is gradual, and there is an alternation between excitement and the normal condition, until the attack is completely established. The symptoms in mania vary according to the intensity of the attack and other circumstances, and are not always alike. The most noticeable symptom is an incoherence of speech, which is caused by the formation of ideas with greater rapidity than the possibility of utterance. He starts upon a sentence, but in a moment and before he has expressed it, he grasps another idea, forsakes the former one and endeavors to utter the second, and so on. If he had the power to put his ideas in speech, they would not appear so confused. There is a complete change of character,—the modest young girl becoming obscene and the besotted rake becoming religious. Illusions are very common and hallucinations are rare. There is hyperæsthesia of all the sense-

organs. Memory of past events becomes very acute. Everything they see or hear recalls some past event and starts them upon it. Their imagination is vivid and they are in a land of dreams.

Sometimes it is an actual *delirium*, and they do not recognize surrounding objects. This is called *acute delirious mania*, or *acute delirium*, or *delirium grave*. It is the most fatal form of acute insanity, except general paralysis, and runs its course rapidly. Patients in acute delirium usually either die or are on the road to convalescence in a fortnight. In this form of insanity, too, there are signs of brain inflammation. The temperature is over 100° F., sometimes reaching as high as 104° F. Exhaustion is very rapid and sleep is absent.

The next form, or *hyperacute mania*, is an intense activity and excitement short of delirium. These several forms are degrees of intensity of the same form of insanity. Mania starting as simple, may become acute, hyperacute, or delirious, but as a rule the degree of mania is settled in its early stage.

An attack of acute mania may end in (1) recovery ; (2) death ; (3) chronicity. *Recovery* takes place in several ways. The excitement may pass at once, the patient who went to sleep a maniac awaking clothed in his right mind. This kind of recovery is not favorable, and it is much better to have the excitement gradually pass away. Therefore, these sudden recoveries must be mistrusted, as the attack may return as suddenly as it passed away. The most permanent recoveries are those in which all the bodily symptoms improve in harmony with the mental symptoms. Thus, improvement in sleep, the appetite, circulation, body

weight, etc., accompanied by a gradual return to reason, is the more favorable. A usual mode of recovery is by alternate calm and excitement, the periods of quiet increasing in length at each return, until the excitement finally disappears.

Acute mania rarely terminates in death unless it is acute delirium, or is complicated with some intercurrent disease. The majority of cases of uncomplicated acute mania recover, and the mass of those who do not recover pass into the chronic state. It is difficult to determine when the acute stage has passed away and the case has become chronic ; in fact, if dementia does not follow, no case of mania can be said to be incurable. In chronic cases the strength returns, the bodily functions are restored, but the mental confusion continues.

*Chronic mania* is not a primary disorder, but follows acute mania. It is the form of insanity of the mass of cases in asylums that present active symptoms. The delusions become fixed, and there is less incoherence. The bodily health is usually good and life may be prolonged for many years.

*Recurrent mania* is the form in which apparent recovery results, followed by a certain interval of sanity, then another attack, etc. It is usually periodical, that is, recurring at regular intervals, and this form is termed *periodical* mania ; or it may have no regularity, the paroxysms depending upon circumstances, and it is then termed *paroxysmal* mania.

*Melancholia* is the form of insanity in which the mental symptoms are of a sorrowful nature, and the bodily symptoms have a depressed and sluggish character. Like mania, it may be divided into *delirious*, *hyperacute*, *acute*, and *subacute*, but these several forms are

degrees of intensity of the same form of insanity. It is the form that attacks persons who are naturally reserved, timid, and scrupulous. For this reason it is twice as frequent among women as men.

The onset of melancholia is slower than that of mania. The bodily symptoms are usually more marked, and loss of appetite and sleep, weakness, constipation, a general disgust at everything, may indicate its coming. It is usually unnecessary worry and anxiety over seemingly trifling and unimportant things that is the earliest noticeable symptom. Confusion of ideas does not occur as early as in mania, and suicide is often attempted before the patient is considered absolutely insane. As the symptoms become worse, there is a painful concentration of the mind upon self (egoism). The patient thinks of nothing else except his sins, his diseases, his unworthiness, etc. His delusions affect himself, and aside from them he may be fairly lucid. His delusions and thoughts are of a painful nature, quite different from mania, which are pleasurable. He may be possessed with the greatest fear and apprehensions of death, and yet constantly seek it. Melancholics talk but little, but in the delirious form they groan and complain and constantly express their terror. Hallucinations are frequent. They hear accusing and threatening voices; they see phantoms, hell-fire, accusing angels; they taste human flesh; they smell bad odors, and they feel disagreeable sensations. They usually have an aversion to their friends and to their home, and this is one reason why melancholics should be removed from familiar surroundings. There are two tendencies almost constant in melancholia, and these are the refusal of food



and suicide. Refusal of food may arise from delusions, or from gastro-intestinal disorders. Suicide frequently comes on as an impulse in patients who have not shown any tendency towards it ; hence, no case of melancholia should be trusted.

The bodily functions in melancholia are, as a rule, much more disordered than in mania. The same apathy and dulness shown in the mental state are represented by sluggishness of secretion and depression of the vital functions. The attitude is expressive of the mental state : the head is hanging, movements are slow, features are drawn, face is thin and pale, and the expression is sad. There are excited cases of melancholia, but the excitement is due to fear and apprehension. Sleep is broken ; the respiration is slow and shallow ; circulation is irregular but feeble, and the pulse is soft ; temperature is lowered, and the extremities are cold and clammy. The breath of melancholics is usually offensive.

Cases of uncomplicated melancholia usually recover. Like mania, the most favorable recoveries are those in which all the symptoms gradually improve. Death from exhaustion alone sometimes occurs, but there is usually in fatal cases some bodily complication. The duration of melancholia is usually longer than that of mania. It seems to be aggravated in autumn and winter. The statements about chronic and recurrent mania apply equally to corresponding forms of melancholia.

*Alternating or circular insanity* is characterized by the regular succession of periods of depression and excitement, or melancholia and mania, with a short period of lucidity between them. The character of the



depression and exaltation is the same as described under melancholia and mania. The several periods may be of different lengths, and the patient may go from one state to the other quickly or gradually. Alternating insanity is chronic, and recovery is very infrequent ; it usually terminates in dementia.

*Acute insanity* either takes the form of melancholia or mania. If a person begins to have a delusion without any other symptom, which grows until it changes his conduct, he is considered insane ; and if there is no acute attack, but a gradual increase of insane acts without bodily change, the insanity is chronic, and is usually of the form termed *paranoia*. It is called a *degeneracy*, and always occurs in persons who inherit imperfect organizations. The delusions are often of persecution ; that is, the patient believes that he is being persecuted for some delusive reason, hence it is often termed *insanity of persecution*. These cases are usually dangerous. They are frequently known as "cranks," and many of the sad homicides of public men are committed by them. In hospitals these cases are always troublesome. They create dissension, and their delusions, which frequently implicate the physician and nurses, make them dangerous patients.

The ill-balanced person is frequently on the border-ground between sanity and insanity. In every community are examples of the eccentric individual, and from eccentricity to the more pronounced acts indicating insanity, is every degree of morbid peculiarity. The peculiarity may be shown in the external habits, such as dress, attitude, or speech ; or in the manner of living ; or in the emotions ; or in excesses. The insanity that starts from an eccentricity usually de-

velops into a chronic condition, popularly called paranoia.

There is a great army of patients known as *nervous invalids* who suffer from neurasthenia, or nervous exhaustion.<sup>1</sup> This is often the condition that precedes an attack of acute insanity, but when there is no explosion of the nervous system as in mania or melancholia, there is a condition in which the will has lost its power, with full retention of the reasoning faculties. This is properly called *cerebral neurasthenia*, and the forms of insanity that have been classified as reasoning mania, lucid insanity, insanity with consciousness, and a host of other names, all belong to this class. These are difficult cases to nurse, for the reason that they have the capacity to argue their positions and to analyze their mental state. They will defend their acts and try to explain them. In no other class of invalids will the nurse's patience be more severely tried.

*Impulsive or volitional insanity*, or insanity of the will, includes all those cases in which there exist either all or part of the time an irresistible tendency to do certain acts. The impulse may be a paroxysm, or may be continuous. If the impulse is to steal, it is called *kleptomania*; if to burn, *pyromania*; if to drink alcoholic liquors, *dipsomania*; if to buy things, *oniomania*; if to commit sexual excess, *erotomania*; if to travel, *dronomania*, and so on without limit. Impulse to suicide is one of the symptoms of melancholia; but the impulse to commit homicide is called homicidal mania, and may be the only evidence of insanity.

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<sup>1</sup> See chapter on Neurasthenia.

*General paralysis* of the insane is, next to mania and melancholia, the most frequent form of insanity. It is a true brain disease, depending entirely upon lesion of the cortex of the brain. It is always fatal, running a course of from three to five years, but is occasionally subject to remissions in which the patient appears to have recovered.

General paralysis is chiefly an insanity of men, the proportion of women affected by it, particularly in this country, being very small. It begins very gradually, more so than any other disease. It is almost impossible to fix its real commencement, and frequently after it is once established, friends can recollect symptoms that appeared years before. Sometimes the first recognized symptom of general paralysis is a fit. These fits are usually confined to one part of the body, without loss of consciousness, and are called Jacksonian 'epilepsy. Among the earlier symptoms are slight twitchings of the muscles of the face and eye, irregularity of pupils, tendency to excesses and exaltation (like simple mania), loss of reflexes, etc. Sleep is disturbed, the appetite is capricious, there may be gastric pain and vomiting, and constipation. There is scarcely an organ or a function of the body that may not become disturbed. The mental changes may be the last to appear, but the difficulty in performing mental work is always realized, chiefly by the patient first. The memory fails, the patient may become moody and capricious, and have fits of passion, but as a rule they feel active and vigorous, and express themselves as feeling "first-rate." One

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<sup>1</sup> From being recognized and described by Dr. J. Hughlings Jackson.

noticeable early symptom is the change of the refined person to grossness and indelicacy, and a forgetfulness of the rules of politeness, or a lapse from a gentleman to a debauchee.

One of the chief special symptoms is an embarrassment of speech. When this is observed, it nearly always marks the disease. Words with many syllables or with a number of *r*'s in them, such as "round the rugged rock the ragged rascal ran" are almost impossible for a general paralytic to articulate correctly. The handwriting is also changed. Motility (motor functions) is quite generally disordered, even the gait being uneven and uncertain. Cases of general paralysis do not usually get into the hospital until they have some decided outbreak, and this usually occurs very soon after the disease has become established. In some cases it opens the scene by a debauch followed by maniacal excitement. There is great exaltation of feeling with ambitious delusions. The patient is immensely rich—so rich that he cannot find any expression to properly designate it. The delusions of general paralysis are really more absurd than in acute mania. Patients in this stage are frequently very obstinate, but they can be switched into new desires by taking part with them, and an ingenious nurse can almost always effect the object in view without a struggle.

The delusions of grandeur usually continue throughout the entire course of the disease. The last stage of general paralysis is one of dementia. Gradually intelligence becomes a blank, memory is lost, no regard is given to decency, the paralysis increases until the patient is helpless, and a crisis or a convulsion closes the scene.

*Idiocy* or *imbecility* is a lack of brain development. It is not a disease, but an imperfect organization. An undeveloped brain may become affected, and an idiot or imbecile may become insane.

Insanity is also connected with other nervous diseases. There is an epileptic insanity, choreic insanity, etc.

## CHAPTER XVIII.

### OBSERVATION AND CARE OF THE INSANE IN HOUSEHOLDS.

THE duty of the nurse upon first undertaking the care of a new case of insanity, is to ascertain in an unobtrusive way the peculiarities of the case, the form of insanity, the relation of the patient to the environment (surroundings), and to thoroughly understand the directions of the physician. More depends upon the nurse in the care of the mentally disordered, than in bodily disease alone ; for unexpected changes occur more frequently, the course of the disease cannot always be anticipated, and the nurse must act upon her own responsibility with greater frequency.

When a nurse enters a household in which there is a patient recently insane, she will find, as a rule, a state of confusion. The calamity is one for which the family are wholly unprepared. Any other form of sickness would have found them prepared, or at least inclined to accept the calamity philosophically, but when the patient is disorderly, incoherent, and not amenable to direction, perhaps noisy and destructive, the relatives are at a total loss how to proceed. If the nurse grasps the situation she can restore order and quiet ; and one of her first duties should be to reassure the friends, as well as to gain the confidence and trust of the patient.

By courage, coolness, discreet suggestions, she may inspire those around the patient with hope, and rouse them to rational, quiet action.

Observation of symptoms should be commenced at once, precisely as for any other form of sickness. If the form of insanity be melancholia, then the first duty must be to see that everything is removed with which the patient can do him or herself a sudden injury. It matters not whether suicidal tendencies have been manifested or not, they are likely to be in every case of melancholia. It will not be necessary for the nurse to give a reason to the friends for everything she does. Talk as little as possible and act with discretion.

Help to decide upon the selection of a room in which the patient is to be cared for, applying the same rules laid down for the "sick-room" (Vol. I., Chapter XXVIII.). If the patient be suicidal or maniacal and the windows are not protected, the room should be upon the first story. Only the necessary furniture should be retained in the room, although it will not be necessary to remove the carpets and hangings, as for acute bodily diseases.

It is always better to select some other room than the one which the patient has been accustomed to using. The familiar surroundings of the usual chamber may be connected with the delusions, and in any case a change is beneficial. Ascertain which members of the household cause the least irritation to the patient, and from such select the assistants. It is often found that the nearest one is the most obnoxious to the patient, and the friends should be made to understand that this antipathy is a symptom of the disease, and must be treated like any other symptom. It is so



difficult for the husband or wife to understand why such a hatred should exist and the tendency is to overcome it by argument. They must learn that it cannot be overcome until recovery ensues, and then it will pass away like other symptoms.

One of the first duties is to ascertain the condition of the excretions. The physician may be informed that the bowels and urine are all right, but the nurse may find them disordered. In nearly all cases of recent insanity constipation is the rule, and with a free movement of the bowels the excitement subsides. A simple and large enema can do no harm and may do a great deal of good. If the urine is not passed within six hours after undertaking a case, then a moist hot fomentation should be applied to the pubic region, and if this is not followed by relief, and the physician's visit is not expected soon, catheterization should be resorted to. By percussion it may be ascertained if the bladder be distended.

When the room is properly prepared for the patient,<sup>1</sup> the necessary arrangements with regard to watchers, food, etc., should be made. The nurse may then commence a systematic observation of symptoms. As far as possible, also, get the confidence of the patient; but do not resort to untruthfulness in order to accomplish this. Be strictly truthful, and do not try to pacify the patient by misrepresentations or make promises that cannot be executed. Should the dishonesty be discovered by the patient, it would result in a serious disadvantage, not only to the nurse, but to the patient.

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<sup>1</sup> If the window cannot be secured and the room is in the second story, some heavy piece of furniture should be moved against it.



It is not probable that a patient with very active symptoms will be treated at home, except cases of acute delirium. This disease runs such a rapid course that physicians sometimes recommend treatment of the patient at home. There should be two nurses for a case of delirious mania, for the patient must never be left unattended.

It may be necessary to keep the excited and exhausted patient in a recumbent position to prevent dangerous exhaustion. One person cannot do this successfully, and it usually requires two or more. Care must be taken not to restrain the patient roughly, or to keep up a constant struggle, as this may become more exhausting than the erect posture. Sometimes merely fastening the sheet to either side of the mattress will suffice to keep the patient in bed; or the dry pack, rolling the patient about in one turn of the sheet, answers very well.

Food is the next most important agent, and must be given frequently and freely. As a rule, delirious patients refuse food, but the refusal is not persistent as it is in melancholia. By careful manipulation and frequent trials, a sufficient quantity of food can be given. If it be still refused, then the patient must be spoon-fed. Concentrated meats, milk, and eggs should be the reliance. Stimulants are usually required in acute delirium. Sometimes rectal alimentation will have to be resorted to, or forced stomach feeding, but this must always be directed by the physician. A foul tongue does not indicate less food. Malt liquors can be given to advantage. Record the time that food is taken and the approximate quantity.

The temperature in delirious mania should always

be taken regularly, preferably in the rectum (do not trust the thermometer in the mouth). If the temperature rises much above 100° F. it is unfavorable.

When the fear of exhaustion is past and the patient can sit up, a turn out-of-doors will do a great deal of good, even if it be confined to the back yard. One of the chief difficulties in having patients treated at their homes, is the objection of their friends to exhibiting them out-of-doors. A turn in the open air will sometimes result in a refreshing sleep. The nurse must insist upon this, and give the patient all possible freedom.

An important feature of treatment is a warm bath, with cold to the head. It sometimes acts like a charm and puts a patient to sleep when nothing else will. The bath should be prolonged—not less than twenty minutes, unless the patient shows signs of exhaustion. The nurse must never take the responsibility of giving medicines of any kind without instruction.

The simple and subacute forms of melancholia are often treated at home and come within the nurse's province. The possibility of suicide should never be forgotten, but the nurse should exercise great care that it be not suggested to the patient by any of the means taken to prevent it.

The natural antagonist of melancholia is fat. It is seldom you see a fleshy case of melancholia. The indications are then to give fattening foods—milk, eggs, farinaceous diet, animal foods, malt, cod-liver oil, etc. The difficulty is that in these patients who need a large amount of nourishment, there is usually an obstinate objection to taking it. Persistence of the nurse, savory foods, and ingenious coaxing will do much toward getting down a proper amount of food.

Cheerful surroundings, a cheery nurse, sunshine in- and out-of-doors, the bright side of things, happy predictions, etc., without giving any indication of affecting the patient, have an influence nevertheless. The melancholia is a mental pain, and pleasant things are its antagonist. Too much sympathy expressed for a melancholic is not good. They are constantly thinking of themselves, and it is better to seem to quietly ignore their troubles.

Bathing is very useful, and massage is excellent. Properly regulated friction and passive exercise have a wonderful effect upon nutrition sometimes. It should not be excessive, and the results must be carefully watched.

Cases of general paralysis are difficult to care for at home except in the stage of dementia, when they may be classified with other demented, or cases in which the mental faculties are dulled.

Cases of senile insanity, or the irritable mental state of old age, are best treated at home, if the proper accommodations and the expense can be afforded. Excitement should be avoided, and routine or set habits should be formed. As the circulation is usually feeble, warmth is required, but it must not be gained at the expense of fresh air. Flannel worn next to the body in winter and summer is required. The night care of senile cases is most troublesome, as they are poor sleepers and have a tendency to wander at night. Rather than have a struggle, let them get up and wander about if they can be kept warm and in the house. Milk is the best diet, given warm and in small quantities, but frequently. The dirty habits often result from forgetfulness, and the nurse must think for her patient.

*Puerperal* insanity, or the insanity that occurs within a few weeks after confinement, occasionally falls to the nurse's lot to meet unexpectedly. This terrible calamity attacking the new-made mother is most distracting to every one concerned, and the cool head and directions of a well-balanced, intelligent nurse, is a Godsend in this emergency.

The form of insanity is nearly always mania, and usually of the most active kind. In the majority of cases it occurs within a fortnight of confinement, while the recumbent posture is still considered important, and the child most needs the sustenance the mother has to give. It usually begins suddenly. The first sign is self-absorption and neglect of the baby. She may have a bad, sleepless night and wake up restless. Soon she begins to talk ceaselessly, foolishly, and becomes violent. She may suddenly attempt suicide, or try to kill her baby. She seems very strong, but her pulse will be found weak, her abdomen tender, and her temperature up to 100° F. or higher.

The physician must be informed at once, the baby removed, and all instruments with which harm can be done, taken from the room. Keep her in bed if possible. Unless she can be given requisite care, which means several additional nurses, she will probably be removed to a hospital without delay. If she is retained at home, then she needs feeding—the most nutritious food and frequently given. There is no form of insanity in which good nursing is more important. The nurse must keep her resting as much as possible without irritating her with restraint. Get her out in the open air as soon as possible. These cases are very favorable ones and the duration of the excitement is

frequently quite short, disappearing in a month. The subsequent treatment is good living, and freedom from anxiety and worry.

For the furore of epilepsy, the nurse must exercise the greatest care to have all articles which may be used to inflict injury removed from the reach of the patient. It is also better to leave such patients alone, as any restraint or direction irritates them ; therefore, leave them alone in the room, but provide some means for observation.

A nurse is sometimes called to the care of cases of *mania a potu* (delirium tremens). There is usually great prostration, but at the same time intense excitement of an apprehensive nature. The nurse can often quiet the patient with soothing assurances. The physician may order the wet pack and cold affusions.

## CHAPTER XIX.

### DUTIES OF A HOSPITAL NURSE FOR THE INSANE.<sup>1</sup>

THE requirements of a nurse for the insane in an institution are usually of an exacting nature, and arduous. The feeling that the intelligent nurse should have, that all the evidence of a bad nature shown by the insane are symptoms of a bodily disease, will help her through her duties. A nurse that is blind to that fact cannot make an efficient one. Her patients may say and do things which are exceedingly disagreeable to her ; but she endures them and retains her equanimity and gentleness, by ascribing such acts to their true cause. She must continually bear in mind that insane persons are not responsible for their acts, because they are impelled to do them by reason of a disease. On the other hand, it should excite the greatest pity that patients who were formerly gentle, reserved, and moral, should suffer such a complete subversion of character.

A nurse for the mentally sick should be a stranger to temper ; and the passions or tendencies to retort must be under complete control. If this is impossible,

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<sup>1</sup> No attempt is made to instruct the nurse in ordinary rules of institutions for the government of attendants. It is assumed that the student is already well acquainted with these rules, which govern the conduct of the attendant upon the insane in almost every respect. An effort is made to distinguish between an ordinary attendant upon the insane of the chronic class, and the nurse engaged in the care of curable cases of insanity.

she should change her vocation. A nurse is liable to gross misrepresentation, she may be struck or insulted, she may have the greatest indignities heaped upon her, and yet she must always consider that they are symptoms of a disease that should call for sympathy rather than vengeance.

But the duties of a nurse are not always unpleasant. If she has the proper spirit, the satisfaction of seeing a gradual improvement in her patient, the dawn of reason gleaming through the chaotic mental state, quiet succeeding excitement, the expression taking on new lines, etc., will more than compensate for what she has suffered. The feeling of gratitude that a recovered patient has for the nurse that has been long-suffering in her care and treatment is often very great.

If the general principle just stated governs the nurse's conduct, the relations of nurse and patient will require but little attention, for such relations will suggest themselves to the nurse actuated by this principle. The nurse should endeavor to create a feeling of trust and not lead patients to fear her; therefore, the proper influence for a nurse to bring to bear upon her patient is a spirit of forbearance, patience, and the greatest self-control. If authority is exercised, and commands take the place of requests, a spirit of resistance will insensibly grow up in the patient. It is not only the immediate result of such action that is detrimental, but it has a marked influence upon the whole course of the disease, and retards recovery.

The nurse's duty is to promote the comfort and welfare of the patient. This is self-evident and is the corner-stone of the vocation. The nurse should become the patient's advocate, and even in the face of abuse



and contumely, should seek the most favorable conditions for the patient's recovery and present comfort ; therefore, they should be restricted as little as possible, and the requisite hospital restriction should be made as free from irritation as possible. It is in this matter perhaps, more than any other, that the care of the insane in recent years has changed for the better. The removal of all suggestions of restraint, such as unsightly bars at the window, a jingling bunch of keys, etc., and, on the other hand, open doors and windows, the removal of unsightly airing courts, have changed the whole character of our hospitals. In fact they are now hospitals, where they were formerly detention places. This has been made possible by adding to the nursing force, and by increasing the efficiency of nurses by instruction. In other words, the attendant has been replaced by the nurse.

The nurse who has the caring for a new patient should possess a great deal of tact and should have the faculty of observation carefully trained. The first impressions of a patient should be pleasant ones. Anything that will excite apprehension must be kept from the new patient. It is therefore much better that the patient should be first received in a small, quiet room upon the wards, than in a large office, with the subsequent passage through long corridors. Speak kindly to the new patient ; ask ordinary questions : " Do you feel tired from your journey ? " " Did your ride chill you ? " etc. When removing the patient from the receiving-room, do not grasp the arm as if removing a prisoner. Ask the patient, calling her by name—Miss or Mrs.—to go with you to her room. If she declines to go, take hold of her hand gently and repeat



the request ; or by putting an arm around her waist she may be gently urged. Avoid taking hold of her arms and pulling. A nurse's incapacity may very well be measured by her awkwardness in this situation. If a patient absolutely declines to go, by leaving her alone for a short time she may go quietly when next requested. Unless there is some reason for not doing so, a patient should be bathed at once for cleanliness, and placed in bed awaiting the physician's examination. If the patient declines to take a tub-bath, there must be no compulsion, but give a sponge bath. Do not give a douche to new patients unaccustomed to them. In bathing a patient, carefully observe the location and character of every mark or deformity, and record it before it is forgotten. Take the pulse, temperature, and respiration, and save the urine for examination. When the physician appears to make the physical examination, he should find everything prepared—towels, a basin of water, soap, an examination blank, pen and ink, etc.

In the observation of symptoms and clinical recording of a case of insanity, the same rules should be followed as laid down for the same duties in the care of the bodily sick. In nearly all cases of recent insanity there are disturbances of the bodily functions, and these should always be recognized, as they may have great importance in the treatment of the case. The clinical records must be kept so that they may be bound and become the permanent record of the case ; but, as stated before, the nurse should make her entry upon the final form, and not make notes to be entered at some other time. The weight of the patient should be taken at the first opportunity, and then weighing

should be done upon the same day of the following week, etc. Take care to have the patient wear the same or similar clothing at each weighing.

Without regard to the mental condition, acts, attitude, or speech of a new admission, address the patient precisely as if you expected a rational answer. If there is no reply, or if it is abusive or absurd, treat it as if it was what was expected and as if it were rational, but do not take the opportunity to retort in kind. There is nothing more painful than to hear a nurse "talk back" to an abusive patient. Give careful attention to every request of the patient. It usually means something even if it is confused. Try and ascertain what is wanted.

The bowels must always receive the early attention of the nurse in a new case. The physician will probably direct an enema following a laxative. This should always be large, given slow to reach beyond the sigmoid flexure. Try and have the enema reach the cæcum if possible, and it can often be assisted by position. Patients who have been neglected at home for a week or two may come to the hospital with body vermin. They should be carefully looked for, and if found reported to the physician and treated by isolation. If the hair is long it may be considered advisable to cut it off. In any case, it should be thoroughly washed with soap and water, and after drying apply tincture of larkspur. This should be repeated daily for three days. Keep this complication from the patient after recovery, as it was probably not a personal fault.

At the outset of treatment the effort of the nurse must be to direct the mind of the patient into healthy

channels, in every way apparent to her. This opportunity is frequently presented in the correction of a patient's habits, in amusement, and occupation. In depressed cases, even where there is no response, a cheerful conversation exerts a good influence. In excited cases, where action seems to be imperative, a healthy outlet can be provided for the activity in active occupation or amusement. Encourage patients to control their impulses, and in every step of improvement encourage them with hopeful auguries. The delusions of patients must be carefully guarded from ridicule, but the nurse should never become a party to them, or express belief in them to gain the patient's confidence. Patients should be encouraged to reveal their hallucinations, and they should be carefully recorded, as they have a clinical importance.

The diet must be carefully regulated, but there are few conditions of insanity that require a restricted diet. Some patients have a tendency to gorge themselves, and others eat too little. The nurse should endeavor to regulate the quantity of food taken. If delusions interfere with nutrition, much can be effected by studying the character of them and meeting the objections that arise by a change in the kind of food or mode of preparation.

Patients in the acute stage of insanity, where the tendency is toward exhaustion, require the same careful treatment as directed in the previous chapter. In well-designed hospitals there are rooms so situated as to give an opportunity for the treatment of these cases without contact with other patients. Free ventilation with a room temperature not below 70° F. is required. These patients frequently suffer from cutaneous hyper-

æsthesia which leads to their denuding themselves of clothing at every opportunity. They must not be permitted to run about nude, and garments can be provided that open in the back. Keep a careful record of the food actually taken, not including that wasted in giving it. Upon the proper degree of nutrition rests their ultimate recovery. A suicide permitted in a hospital with all the provisions necessary for proper supervision, usually shows neglect of duty. The pulse indicates the condition of the patient, and any sudden change in its character—irregularity, or intermittency, or great weakness,—should be at once reported.

In the care of the demented, much can be done by the efficient nurse to make them more comfortable, and in improving their condition. Stimulate self-care, and do not allow the mental faculties to decay from disuse. When the dementia is so far advanced that no attention is paid to the calls of nature, much can be done in correcting the habits by taking them to the closet at stated intervals with great regularity.

The clothing in these cases must be changed frequently, even if it is not soiled. It collects odors from the exhalation of the skin alone. Demented patients and general paralytics in the last stage should be given food that is so finely divided or soft as not to choke them. They seldom chew their food.

It is also this class that contract *bed-sores*. It is not only pressure from long confinement in bed that causes bedsores, but a paralysis of trophic functions of the nerves (Vol. I., Chap. XVI.). In cases of general paralysis that are confined to bed, bed-sores are likely to appear within a few days if they are not carefully watched. They should have their position changed frequently,

and may be allowed to sit up for a short time daily. The greatest cleanliness must be observed, and the part subjected to pressure bathed in diluted alcohol. They are far more easily prevented than healed. Smooth sheets and underbedding, freedom from crumbs, immediate cleaning from urine, daily bathing with alcohol, dusting of the parts after bathing with oxide of zinc, relieving the pressure by air cushions or water beds, are among the means of prevention. When a slough has once formed, the charcoal or yeast poultice, aristol sprinkled upon lint, carefully removing dead tissue, stimulating granulation with balsam of Peru, are agents of value.

The influence of the bodily health upon the mental condition is greater than it is generally believed to be ; therefore, the bodily functions require as much attention in the treatment of insanity as in any other disease. Hygiene of the ward, in which is included ventilation, warming, cleanliness, and care of the person with reference to cleanliness, clothing, and diet, is one of the essential duties of the nurse. It is one of the nurse's duties to take careful note of any symptom of bodily derangement and failing health, and to report it promptly. The urine of patients is now examined regularly in all properly conducted hospitals, and the blood of every acute case is critically examined, with reference to its quality and the proportion of blood corpuscles it contains.

Emergencies frequently occur among the insane, and they are sometimes unavoidable. They should be treated as emergencies are elsewhere ; the advantage being that medical aid is always within easy reach. *Bites* from insane patients are quite irritating, and when

the skin is penetrated the wound should be promptly washed out with an antiseptic solution, and dressed with aristol, or some kindred article.

The more usual fractures occur from patients slipping upon the floor or from being thrown down. Colles's fracture and intracapsular fracture of the neck of the thigh bone are the more frequent.

Patients choking from large pieces of food lodging in the pharynx is an accident that will not occur often if the proper care is taken with the food, as referred to in another chapter. Get a physician at once, and in the meantime relieve the patient from interference with breathing by the introduction of the finger. Injuries are sometimes caused from patients attempting to eat glass or swallow indigestible materials. If the former calamity occurs, remedies are given that quiet the action of the stomach, and food is taken with little liquid in order to surround the glass and prevent its cutting. It has also been recommended to swallow cotton. Needles and hair-pins are sometimes thrust into the body. When one of these appear near the surface, the physician should be informed at once.

## CHAPTER XX.

### BATHS AND BATHING.

A *bath* is some medium in which the body is partly or wholly immersed, and may be used for purposes of cleanliness, or for the cure or mitigation of disease.<sup>1</sup>

Baths may be classified according to the medium employed, such as *water, vapor, air*, etc. ; according to the temperature, as *hot, temperate, cold*, etc. ; and according to the effect sought for, as *nutritional, stimulant, medicinal*, etc.

The baths that come within the province of the nurse are either for cleanliness or for some therapeutic purpose, usually to reduce fever or inflammation, or for some effect upon the general circulation. When given for cleanliness, baths are usually *simple*, either by immersion of the body in water, or by the application of water to the body, and are known as hot (100° to 112° F.), warm (90° to 100° F.), tepid (70° to 90° F.), and cold (33° to 65° F.).

When the patient is unable, either from feebleness or other cause, to take an immersion bath, it will be necessary to give a *bed*, or a *sponge bath*. To do this, the bed must be especially prepared by a rubber and a draw sheet. The room should be warm and no draughts

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<sup>1</sup> For the anatomy of the skin see Vol. I.



permitted. Everything likely to be needed should be provided at hand so as not to interrupt the operation. The time for giving the bath, when not otherwise provided for, should be the time for changing the bed linen, but must not be within two hours after a meal, or directly before it. A sufficient amount of hot and cold water in separate vessels should be at hand, as well as soap, sponges, towels, and clean clothing. It is well to have several hot-water bottles convenient in case the patient should become chilled. Take a portion of the body at a time, wash and dry it before exposing any other. It is an operation that should not be rushed. The wash-cloth should be of flannel, or a sponge can be used. Have the clean garments all warmed and aired, ready to put on. The towels should be dried and warmed. Commence the bath at the face and proceed downward, leaving the back and private parts to the last. To neutralize the body odor a little bay rum, cologne, or Florida water may be added to the water ; or, if required for cleanliness, some ammonia or borax can be added. Do not attempt to make one towel suffice for the bath, nor use a towel after it becomes damp. Add hot water as the bath cools, or change the water several times during the bath. After the bath, some light refreshment can be given.

To change the clothing without lifting the patient, some ingenuity is required. A night-dress can be taken off by slipping the arms out of the sleeves and folding it up to the neck, slipping the clean one on the arms, and placing it beside the soiled one. Then when the patient is lifted, the soiled one can be removed, and the clean one slipped over the head. Sometimes it is advisable to rip the night-dress up the back and avoid



lifting the patient at all. When a limb is injured, dress that one first.

The efficiency of a nurse is often indicated by the dispatch and neatness with which she can bathe patients in bed without giving the patient discomfort.

In giving a tub bath, the water should be prepared and tested before the patient enters it. It is the height of imprudence to allow water to run into a tub while a patient is in it. Scalding may occur before it is possible to turn off the hot water, or the cold water may cause a serious shock. Have sufficient water to cover the body to the neck. There should be at hand cloths of Turkish toweling, a sufficiency of towels, soap, etc.

Baths for remedial purposes are usually prescribed by the medical attendant. They usually have reference either to reducing or promoting the body temperature, but are sometimes prescribed for their stimulating effects upon the body nutrition. For these purposes they may be general or local, simple or medicated, of water, vapor, or air. The temperature and duration of a bath are prescribed, but the nurse must sometimes exercise a personal judgment of the effect produced and act accordingly.

The *cold bath* is usually employed to reduce fever temperatures. Its form is the cold plunge, the cold pack, and the sponge bath. 'Tubbing' is the most effectual method, and where a portable tub is available it is not difficult. The tub is first filled two-thirds full of water and rolled to the side of the bed. The clothing is removed from the patient, a sheet rolled about him, and he is gradually submerged, beginning with

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<sup>1</sup> Cold plunges for typhoid fever were introduced by Dr. Brand, and are now known as the Brand method.

the feet. A head rest should be provided, by a folded sheet stretched across the head of the bath; or a rubber air cushion suspended from the head of the bath answers very well. The water should be  $70^{\circ}$  F., and maintained at that temperature, or slightly lowered by the addition of ice-cold water as it rises. One hand should be free for the nurse to feel the pulse. Any evidence of depression should lead at once to the removal of the patient. A dry sheet should be ready to wrap about the patient as he is lifted out of the bath. He is then laid upon a rubber sheet and wrapped in blankets and not disturbed for ten or fifteen minutes. In the meantime the temperature is taken in the mouth, and every half hour for three times.

Some patients cannot stand as low a temperature as  $70^{\circ}$  F., as the shock is too great, and in such cases the temperature can begin at  $80^{\circ}$  F., and be gradually reduced. At the first trial, immersion should not exceed ten minutes, but after the patient becomes accustomed to them, they may be increased in duration. The signs of depression are tremor, dark appearance of the skin, and a feeble pulse. Friction can be given either in the tub or after removal, either by a flesh brush, flannel cloths, or the bare hand. Sometimes stimulants are necessary. Hot bottles can be placed to the extremities if they are cold. The body temperature may be lowered by a cold bath from one to six degrees. The indication for a cold bath is when the temperature exceeds  $102^{\circ}$  F. The pulse is always somewhat changed by the bath, and has a wiry feel due to the reflex contraction of the walls of the arteries (increase in tension), but a soft, feeble pulse indicates vital depression and is unfavorable.

Besides lowering the temperature, a cold bath has a tendency to reduce the nervous symptoms. Sleep often follows, and a previous delirium is succeeded by quiet. In case of hæmorrhage, a cold bath is contra-indicated.

A *cold pack* or *envelope* bath is given by preparing the bed with a rubber blanket covered by three or four blankets, and a sheet wrung out of cold water.<sup>1</sup> The patient is laid upon this, and the sheet folded over him snugly, and well tucked in. The blankets are then folded over the sheet to the extent deemed necessary. At the end of fifteen to thirty minutes, the procedure is repeated.<sup>2</sup> The feet should be left free, so that heat can be applied if necessary. The patient is usually thirsty and should be allowed to drink freely. The pack is very soothing to the patient, who will often fall asleep while in it. If the head symptoms are marked, cold compresses or the ice cap can be applied to the head. When the pack is removed, the patient should be dried quickly and wrapped in a dry blanket.

In giving a sponge bath to reduce the temperature, observe the same precautions as in giving a sponge bath for cleanliness. As the baths must be given frequently, the patient should be disturbed as little as possible. Instead of using a rubber sheet, towels can be tucked underneath the body to protect the bedding. A cold compress should be kept applied to the head and changed frequently. Keep the water down to 60° F., with ice. Large sponges can be used to apply the water, and there should be several of these to per-

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<sup>1</sup> For a hot pack, the sheet should be wrung out of hot water.

<sup>2</sup> It is claimed that four cold packs of fifteen minutes each are equal to one tub bath of ten minutes.

mit their frequent changing. The bath should be administered slowly, and as little friction used as possible.

The *fever-cot* is another method of applying cold that has some advantages. A frame large enough to surround the patient is covered with burlaps, in which the patient lies wrapped in a sheet. Water is thrown over him, either by a dipper or pailfuls, until the desired effect is obtained ; or a water pot used for sprinkling may be used. A trough can be improvised with a rubber sheet underneath the frame to conduct the water to a vessel. Another method of applying cold is by placing wet towels or sheets wrung dry enough not to run upon the body, and left for a few moments.

In sponging a patient, make the stroke downwards. In wiping or rubbing the body, always make the movements toward the heart. By adding alcohol to water, it increases rapidity of evaporation, hence is more cooling. Delirium, or head symptoms with fever, calls for cold applications to the head. Drinking should be encouraged during a cold bath.

Cold baths are sometimes used for their stimulating effect and the reaction that follows. Where they are suited to the person and not too long continued, they are tonic and bracing ; but if reaction is not prompt and complete, they are injurious. This is shown in shivering, an uncomfortable feeling in the head, and a continued blueness of the skin. It is a good plan to have the patient engage in rubbing himself, or in some other action. Diseases of the heart or arteries contraindicate cold baths.

Foot-baths are usually given hot to divert the blood from the head or to direct it to the abdomen. They

may be given in bed by spreading a rubber sheet over the bed, and by the patient lying upon the back and bending the knees, placing the feet in the bath. If the patient can sit up, a blanket can surround the patient and tub. If counter-irritation is desired in a greater degree, mustard can be added.<sup>1</sup> A foot-bath may continue for twenty minutes, but the temperature of the water should be maintained by adding hot water. When the feet are removed they should be well dried and wrapped in some woollen fabric.

In *sitz* or *hip-baths*, the patient sits in the tub with the feet outside upon a raised surface, and the body is immersed from the knees to the umbilicus. These baths are always hot, and are used in obstinate diarrhoea and in pelvic inflammations. Sometimes they are given to excite the menstrual flow. They are prolonged for fifteen minutes.

*Hot baths* are used to induce perspiration, to calm the nervous system, and to allay spasm. When given for its action upon the skin, care must be taken or the object will not be gained. The tub is half filled with water at 100° F. The patient is placed in it, and the temperature of the water is gradually increased. Hot water must be added by vessels, and not by turning the hot faucet, or the patient may be scalded. Raise the temperature to 110° F. The baths can be prolonged for twenty minutes. Remove the patient, who should be immediately and closely wrapped in hot blankets, giving plenty of water to drink. After the sweating is maintained for an hour, gradually remove the blankets, and sponge the body with tepid water and alco-

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<sup>1</sup>Several tablespoonfuls of mustard can be mixed in water, and stirred into a paste, before it is added to the bath.

hol. Fainting is likely to occur in a hot bath, hence the pulse must be watched. The hot pack is equally efficient for starting perspiration. The head should always be kept cool. For the convulsions of children, no remedy is more efficient than the hot bath.

*Hot air, vapor, or steam* baths are the surrounding of the body with the desired medium. If the patient can sit up, place him in an open wicker chair, with the feet upon a stool. Surround with blankets fastened closely around the neck and reaching to the floor. Underneath the chair place a spirit lamp, boiling water, or whatever medicament it is desired to use. Evaporating vinegar is called an *acid* vapor bath. For giving vapor baths to bedridden patients, special apparatus is required.

Local inflammations can be relieved by local baths, thus a foot-bath for a sprain, etc. Medicated baths are chiefly used for diseases of the skin. Mercurial baths are given in the form of vapor for syphilis. It is given the same as a vapor bath by fusing calomel in a water-bath.

*Milk* baths are given for nutritive purposes. An *alkaline* bath is the addition of about 10 ounces of carbonate of potassium to a tub of hot water. *Mud* baths are sometimes prescribed for uterine diseases. The body is surrounded by a paste made of earth at a temperature of 90° to 100° F. A *sun* bath is the exposure of the naked body to the sun's rays. A *starch* bath is made by the addition of one pound of starch to 30 gallons of water, and is used in squamous and irritable conditions of the skin. *Bran* bath is made the same as a starch bath and used for the same purpose. A *sulphur* bath is made by adding 4 to 8

ounces of potassium sulphide to 30 gallons of water, with the addition of a few drops of sulphuric acid. It is used in skin diseases, the itch, lead colic, and palsy. A *pine* bath is prepared by adding a decoction of pine needles to hot water. It is mildly stimulating.

A *Turkish* bath is really a hot-air bath. The bather is placed successively in rooms of higher temperature, until the skin gets to acting freely, then the body is shampooed or rubbed, and is finally stimulated by a *douche* or plunge of cold water.

A *Russian* bath is the use of steam instead of hot air, but with this exception the process is the same as the former.

*Affusion* of water, by means of the *douche*, or the precipitation of water upon the body, goes by the several names of *douche*, *rain*, *shower*, or *surprise* bath. The stream is usually divided by passing through perforated metal plates. The force with which the stream impinges upon the body has much to do with the efficiency of the bath. These baths are used therapeutically for their stimulating effects upon the circulation, and the temperature of the water is changed alternately from hot to cold.



## CHAPTER XXI.

### MASSAGE.

*Massage* <sup>1</sup> is a manipulation of the tissues of the body applied to the skin according to a system. It means *to knead*. A male operator is called a *masseur*; a female operator, a *masseuse*.

It is substantially exercise given to the patient without any nervous action, that is, without the exercise of the will. It may be combined with movements in which the patient assists or resists, and these are called *Swedish movements*. Massage, however, is intended to cover all movements of the body that are made by another for the purpose of cure.

The effects of massage are manifold, but its chief effect is upon the circulation and nutrition. It diminishes blood pressure and lessens the action of the heart, and in this respect differs from voluntary exercise, which increases the action of the heart. The explanation of this is, that by massage the blood is urged along its course by the manipulation of another, and the heart is saved the labor of forcing it to this extent. The hands of the operator are an auxiliary

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<sup>1</sup> Massage cannot be taught theoretically ; hence it is a subject that is left largely to the practice classes. The theory of massage, the use of terms, its physiological effects, etc., will be the purpose of this recitation.



heart. By facilitating the movement of blood through the tissues, the nutrition of the part is increased—the vessels absorbing and carrying away effete matter, and giving up nutritive matter. The power of increased absorption is shown in the removal of swellings and tumors by massage. It has a soothing effect upon the peripheral ends of the nerves; the soothing effect of gentle stroking is familiar to every one. The action of the skin is increased, and both the sebaceous secretion and perspiration are facilitated. The chief advantages of massage are that the nutritive changes that result from exercise are extended to the greater detail of tissues—the skin, areolar tissue as well as muscles—with complete rest to the nervous system. The effects upon the nervous system are both tonic and sedative; while it is being performed and sometimes for hours afterwards, the patient is in a blissful state of repose. It often relieves sensory troubles—headaches, pains in muscles, joints, etc.

There are several modes of performing massage, and these can, for the sake of simplicity, be grouped under four heads: *friction*, *percussion*, *pressure*, and *movement*. These acts may be combined, as in kneading, which is a combination of the last two. Each or all of these may be gentle, moderate, or vigorous. The following are rules of procedure which the students must generally observe (Fig. 37).

(1) The form of massage may be changed from one to the other, or be combined, but should always begin gently and gradually increase to the extent desired, and then decrease to end gently.

(2) Use as much of the surface of the hand as possible, and avoid using the ends of the fingers alone, ex-



FIG. 37.—POSTURE IN SOME FORMS OF MASSAGE.

A, kneading or pinching with thumb and fingers; B, kneading with both hands, or squeezing; C, kneading on the hand for deep muscles and tendons; D, friction with the fingers; E, position for clapping the extremities; F, beating over nerve trunks; G, position for hacking; H, percussion with the tips of the fingers; K, stroking the heavy muscles of the hips; L, exercising the ankle; M, exercising the knee; N, stroking the forehead; O, exercising the shoulder; P, kneading the thigh.

cept in prescribed cases ; and get an easy position that will cause the least fatigue to the operator.

(3) The room should be well ventilated and kept at a temperature of 70° F., and the patient should have an easy position.

(4) The length of massage must be prescribed by the physician, but as this can only be given in a general way, much will depend upon the rapidity and efficiency of the operator, and the effect upon the patient must aid in determining this point.

(5) The direction of the movements must always be toward the heart, unless there be a thrombus. This complication will be pointed out by the physician and can be avoided. In friction the movements may be circular, but they should begin at the extremity and move toward the trunk. The heavier stroke should be always the one toward the heart.

*Stroking (effleurage)* or *friction* may be done with one or both hands. It may be performed with the palm of one or both hands, or with the thumb or fingers. Stroking with one hand is used upon the extremities, the back of the head, and the neck ; the thumb is used between the muscles, or a muscle and a tendon ; and the ends of the fingers are used principally around the joints. The object of stroking is to cause the emptying of superficial veins, thereby causing absorption, and the force may be from a mere touch to the strongest pressure. *Frictions* are usually circular movements, and are given with one hand, or with the thumb or fingers. The thumb is used for frictions upon the smaller muscles and around joints ; with the whole hand upon the larger surfaces, like the thigh and back. Friction should always be followed by stroking. The

force used in friction is often much greater than necessary, as it is only intended to act upon the skin. If counter-irritation is desired, then the use of a coarse towel or a brush is admissible ; but if irritation is not desirable, the skin should be protected with some oily substance.

*Kneading (pétrissage)* is a combination of *pressure* and *movement*. It acts by causing a double pressure upon a muscle, while at the same time it raises it. The tissues beneath the skin are operated upon without allowing the hands or fingers to slip upon the skin. When individual muscles are kneaded, the two thumbs are used ; and the thumb and fingers are used for pinching the muscles. Kneading with both hands, or squeezing, is used upon the extremities. The object of kneading is to reach the muscles with a double pressure, that is, from the sides.

*Percussion (tapotement)* is an action of the wrists, with a quick movement. It may be in the form of slapping with the palms of the hands (*spanking*), when it is desired to act upon the skin and superficial parts ; or by using the border of the hand (G), called *hacking (chopsticks)*, to affect the muscles and deeper vessels and nerves ; or by tapping with the tips of the fingers (H) (*punctuation*), used chiefly upon the head ; or by the clinched fist (*beating*), used upon the hips and over the larger nerves. These are called *vibrations*. The movement must be quick and rapid, without using much force.

In addition to the forms here named, there is *sawing (sciage)*, which is a saw-like movement of the hands crossing and re-crossing each other, at the same time pressing up the muscles, used upon the limbs and but-

tocks ; *rotation*, used in joints (L), especially ball and socket joints, for exercise or breaking up adhesions ; *shaking* (*secousses*), which is a series of sudden jerks, with the palms of the hands placed against the walls of the chest or abdomen, used in slow and weak circulation ; *pulling* (*traction*), which consists of grasping the soft tissues and stretching them, sometimes used in neuralgia and sciatica. There are also *flexion* and *extension* of limbs, and *twisting*.

Besides the hands, which are chiefly used alone in massage, instruments are occasionally used as aids to the hands. A glove with a palm composed of soft bristles is used for friction. A combination of small wooden or rubber wheels upon a handle called a *roulette*, is sometimes used for rolling the muscles. An instrument made of thin wood and covered with rubber is used for percussion ; and for this form of massage a flail is made of an inflated dry bladder. An instrument shaped like a sickle, made of wood or metal, called a *strigil*, is used for scraping the skin. There are also brushes of various kinds, made of flannel, horsehair, rubber, etc., used for friction, and brushes of twigs or reeds used for whipping (*flagellation*).

It is a proper precaution to prepare the skin, when the operation is to be prolonged or severe, especially if it be greasy ; washing with tepid water containing some alcohol and ammonia is cleansing and removes all sebaceous matter. When it is desired to reduce friction, cocoa-oil, or vaseline, or in fact any kind of oil, may be applied. If the skin is very sensitive, chloroform liniment may be used.

The best hands suited to the application of massage are broad, smooth, flexible, warm, and dry (*Hale*).

Good training can improve the hands, but a cold, clammy hand is entirely unsuited. Rings and bracelets cannot be worn while massing.

Massage may be *general*, that is, applied to the whole body ; or *local*, where the treatment is directed to separate parts of the body. In general massage, applications should begin with the feet, proceeding to the legs, arms, chest, abdomen, and the posterior aspect of the trunk. The patient should be lying in bed and have the body covered, except that part being operated upon. The time occupied should begin with half an hour, and the seances should be gradually extended to an hour. Massage, like baths, should not be given immediately after a meal. Two hours at least should elapse between eating and the operation.

In the local application of massage, its form depends upon the location and the effect desired. In massage of the *leg*, the position may be recumbent, or semi-recumbent, the usual forms applied being stroking, kneading friction, and percussion, always ending with stroking. In massage of the *arm*, the patient may be sitting with the arm supported, the operator standing at the side ; the same forms are used as for the leg. For the *chest*, the patient should lie flat without a pillow ; the arms are extended at the side ; stroking with a circular motion, friction and kneading with thumb and fingers, and sometimes tapping and hacking around the region of the heart, are used. For the *back*, the patient lies upon the face without a pillow ; the same forms being used as in the last. For the *buttocks*, the patient stands with body bent forwards, supported by a bed or couch ; in addition to the previous forms, beating is used. For the *abdomen*, the patient lies upon the back with knees drawn

up, the operator sitting or standing upon the right side ; friction should be applied with tips of fingers by a peculiar movement called the *spider*. The fingers are extended and a stroking movement is made alternately with each hand toward the umbilicus, until the whole abdomen has been covered ; also use moderate kneading. For the *liver* and *spleen*, the patient lies upon the left side for the former, and the right side for the latter ; friction to be made with the whole hand in large circles, percussion over the whole surface. For the *head*, the patient should sit in a comfortable position ; stroking, beginning with the back of the head, friction with one hand, the other supporting, and hacking are the forms used.

The several organs of the body are sometimes massed, but the directions for these manipulations should be taught in the practice class.

Diseases of the skin, thickened and unyielding arteries, abscesses, pregnancy, pulmonary consumption, Bright's disease, are all contra-indications for massage.

*Swedish movements* are various positions and movements, made either with or without the patient's assistance. They are divided into classes that may be simply expressed as :

(1) *Passive* movements, which are movements applied by a second person, the patient rendering no assistance, or, in other words, remaining passive.

(2) *Active* movements, performed by the patient without any assistance from a second person. To this class belong gymnastic exercises.

(3) *Active-passive* movements, which require the assistance of the second person, in which the movements are performed by the patient while the second person resists.



(4) *Passive-active* movements, in which the second person performs while the patient resists. The second person may be replaced by machinery or any fixed object.<sup>1</sup>

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<sup>1</sup>These several classes should be practically taught in the physical exercise class.



## CHAPTER XXII.

### MEDICINES AND THEIR ADMINISTRATION.

*Medicines* may be given for remedial purposes to act locally, at the point of application, or for their systemic effect, and when given for the latter purpose, they are absorbed into the circulation either through the mucous membranes, the skin, or the subcutaneous tissue.

The form in which medicines are given depends upon the mode of administering them. If to be absorbed through the mucous membranes, they may be given in powder, liquid, solid, or vapor ; if through the skin, either as liniments, plaster, oleates, etc., and if hypodermatically, they must be in the form of a perfect solution of a non-irritating character.

An *extract* may be solid, semi-solid, or liquid, and is made by expressing the juices from the crude drug either directly by pressure, or in adding some medium which dissolves out the active principles.

A *tincture* is a fluid preparation that is obtained by treating a vegetable drug with alcohol.

An *elixir* consists of some medicinal substance mixed with diluted alcohol, which has syrup and aromatics added to it, to improve its taste.

A *mixture* is a liquid preparation containing a variety of substances either dissolved or not.

A *decoction* is made by boiling a crude vegetable drug in water for a greater or less time.

An *infusion* is made by steeping a crude vegetable drug in water, either cold or hot, and straining the product.

An *emulsion* is a fluid mixture which consists of an oil which is finely divided by some mechanical means. Milk is an example of an emulsion. It is always opaque and usually of a whitish color.

A *syrup* is a fluid preparation of a watery character that contains a large amount of sugar, either to improve the flavor of the medicine or to preserve it.

A medicinal *wine* is a feeble tincture. Instead of using alcohol, some white wine is used.

A *pill* is a favorite form for administering medicines in a solid state. It has the advantage of accurate dosage, ease of administration, and tastelessness. Its disadvantage is its comparative slowness of action.

A *tablet* is a solid disk of small size, made of some material soluble in water, pressed into shape and not coated.

A *troche*, or *lozenge* is a disk-shaped solid preparation, made of some inert substance mixed with the medicine, and intended for slow solution in the mouth.

A *confection* is a material composed of soft confectionery in which are incorporated medicines, and it is intended to make them palatable.

*Powders* are medicines that are mechanically reduced to a state of powder and are administered in that form.

An *ointment* is a fatty preparation that will melt at the temperature of the body, and is intended for application to the skin.

An *oleate* is also a fatty preparation made from oleic

acid, and is an oily fluid or a very soft unguent. It has the advantage over ointments of penetrating the skin much more rapidly.

A *liniment* is a fluid preparation intended for application to the skin. Liniments are very numerous and are made of various materials, and are chiefly used for their local effect.

A *cerate* is a fatty preparation that has a waxy body added to it to make its melting point above the temperature of the body. It is used as a permanent dressing and is applied spread upon fabric.

*Plaster* is made of various materials that soften when applied to the body, but do not melt, and are applied spread upon some backing. They are used for mechanical support and for counter-irritation, but possess very feeble medicinal properties.

A *suppository* is a plug of medicated material that liquefies at the temperature of the body, and is designed for the introduction of medicines into the rectum, vagina, and urethra.

A *capsule* is a hollow body made of gelatine, intended to hold medicine from the mucous membrane of the mouth until it reaches the stomach. The gelatine dissolves very readily in the gastric juice.

A *trituration* is the grinding and mixing of solid substances with sugar of milk until they are finely pulverized. They are sometimes pressed into tablets and are then termed *tablet triturates*.

Medicines are introduced through the skin either by placing the medicine in contact with the skin, and allowing it to remain undisturbed, or by using friction and "rubbing it in," which increases absorption. This is called *epidermic* medication. *Endermic* medica-

tion is the removal of the cuticle by blistering and the application of the medicine to the raw surface. This has been superseded by *subcutaneous* or *hypodermic* medication, which is the administration of medicines by injecting them underneath the skin, into the areolar tissue, or into the muscles.

Every nurse should understand how to administer a hypodermatic injection. The advantage of this method is the rapidity with which absorption takes place, and the consequent speedy results that are obtained. A drug that requires half an hour to show its effects when given by the stomach will give results in from one to five minutes when given subcutaneously. A syringe should be tested to see that the packing around the piston is snug. If it is shrunken by becoming dry, it should be allowed to soak in warm water. It can be tested by filling with water (the needle unscrewed) and by placing the finger over the outlet and depressing the piston. The needle should be sharp and unobstructed. Only the active principles of drugs that dissolve in water are given in this way, but in cases of emergency alcoholic stimulants and ether may be given subcutaneously.

The best way to make a solution is by putting the proper amount of the drug in a tablespoon. Draw the syringe nearly full of water and discharge upon the drug, filling and discharging the syringe until it is all dissolved; then carefully draw the solution into the syringe. Then hold the needle upright and force out any air that may remain. Take up the flesh between the thumb and the fingers, and quickly insert the needle nearly at right angles to the skin for at least an inch, withdraw the needle for a quarter of an inch, and

discharge the fluid slowly; remove the syringe, and hold the finger over the point of exit for a moment so that the fluid will not escape.

There are several precautions in giving a subcutaneous injection that the nurse must always bear in mind.

*Have an absolutely clean syringe.* Asepsis must be procured, and if there is doubt about the syringe, by allowing a carbolic solution (1 to 20) to rest in the syringe for a time, and then by working it through the needle, afterwards thoroughly washing out the acid, safe antisepsis may be procured.

*Remove the air.* This must not be forgotten, for if the air should gain an entrance into a vein it might prove very serious if not fatal.

*Have a clean solution.* It is safer to use water for a solution that has been sterilized, or water that has been recently boiled.

After giving the injection, remove the needle, blow through it to remove the liquid, insert the wire, and carefully wipe it. By drawing alcohol into the syringe, it will clean it and prevent the needle from rusting. It is a good plan to leave a drop of liquid in the syringe to prevent the packing from drying out.

Hypodermics are given to relieve pain, for rapid stimulation, or where speedy action is desired. In the care of the insane who refuse to take medicines, they are sometimes given in this way. If the syringe is not clean, or the solution is impure, or on account of lowered vitality an abscess follows a hypodermatic injection, it should be treated in the same manner as suppuration elsewhere. If proper care be taken in giving an injection, an abscess will not occur. The painful spot remaining after an injection may be re-

lieved by bathing with alcohol or tincture of arnica. The injection should be given in the fleshy parts of the arm or leg. Avoid bony prominences and the location of large vessels and nerves. If the skin is not clean it should be thoroughly washed.

It is now usual to have tablets of medicine prepared in proper sized doses ; these can be introduced into the barrel of the syringe, which is then filled with water and the tablet dissolved. Solutions for subcutaneous use should be made fresh in any case, as they decompose upon standing. The addition of atropine to morphine neutralizes some of the unpleasant features of the latter. The nurse should never give a hypodermatic injection without direction by the attending physician.

The usual mode of introducing medicines into the system is by absorption through the mucous membranes of the stomach, in one of the forms heretofore described. Pills and tablets are the most convenient forms, although occasionally patients will be met who are unable to swallow pills. In the case of children, it is sometimes difficult to get them to swallow pills. If they are inserted in a lump of cake, or a spoonful of jelly, deglutition may carry them down. Powders are inconvenient forms for medicine, but some cannot be prepared in any other way. Empty gelatine capsules, oblong in shape, can be filled with powder, and it is surprising how large a capsule will be carried down with a swallow of water. Wafers made of dough<sup>1</sup> wrapped about powders are pleasant means for administering them.

The time for giving medicines is usually included

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<sup>1</sup> A drop of thin dough flattened out with a hot sad-iron.  
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in the physician's directions. If not, the usual rule is to give medicine after meals ; this applies especially to all forms of medicines containing iron or acids. Medicines taken in an empty stomach are absorbed more rapidly ; hence, laxatives and purgatives can be taken before breakfast, or at night before retiring. Medicines acting as aids to digestion should be taken soon after eating. Strong acids should be taken well diluted, and these, as well as mixtures containing iron, should be placed well back upon the tongue, and the mouth should be well rinsed afterward to prevent their action upon the teeth.

Many patients find it difficult to take oily substances. Castor and cod-liver oil may be made into a sandwich,<sup>1</sup> or mixed in part of a cup of hot beef-tea, or a slice of lemon may be taken in the mouth afterward. Emulsions can be made of oils that are quite palatable.

Some medicines are incompatible with each other and with some forms of food ; thus milk and acids, or quinine, if given together, will not agree, and give rise to digestive trouble.

All medicines should be plainly marked, and a nurse must never give medicines from an unlabelled package. The label should give the dose and the time for administration. All poisonous medicines should have a distinctive label, and medicines for external use only should have some peculiarity of the bottle that will appeal to touch as well as sight. It is a good plan to tie a string around external remedies, as well as partic-

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<sup>1</sup> In a graduate or slim glass a tablespoonful of wine is gently covered with the oil, over which is dropped a spoonful of brandy. The oil being sandwiched between the two, escapes past the mouth unnoticed.



ularly strong medicines, to attract attention. Keep medicine out of reach of children. Have one place for medicines, and return the package at once after every use. Do not attempt to give medicines in the dark or in uncertain light.

In hospitals it should be the rule to have as few medicines upon the ward as possible; it is not good practice to make a small dispensary of every ward. As soon as a medicine is stopped, return the package to the dispensary at once. Poisons must not be kept upon the ward. A nurse should be detailed to look after the administration of the medicine for a ward, and then the responsibility for errors can be located. Most drugs deteriorate by keeping, and many by exposure to light; hence, they should be kept in a dark and cool place. The medicine-closet should always be neat, clean, and methodically arranged, and have a list of contents fastened inside the door for ready reference. It will frequently save the misplacement of all the bottles.

The nurse should implicitly obey instructions regarding the administration of medicines. They should be given exactly at the moment ordered; but unless the directions are to the contrary, a patient should not be disturbed from a desirable sleep to take medicine. The dose should be accurately measured, and guessing should never be done. Sometimes it is left to the nurse's judgment, the condition of the patient, the effect of previous treatment, etc., whether a medicine should be given or not. Except in such cases the nurse should not assume the responsibility in giving medicines when unexpected results are obtained. Some medicines are *cumulative*, that is, the effect of



one dose is continued and added to another, until the combined doses act with unexpected violence. An illustration is digitalis. Under these circumstances the medicine can be withheld until the physician's visit. There may be an idiosyncrasy (individual peculiarity) that leads to unexpected action of a medicine. Some medicines lose their effect after being taken for some time; this is called toleration. This is particularly true of narcotics. Nurses should record in their bedside notes the effects of new medicines.

A *placebo* is an inert substance given to represent a medicine. It is sometimes useful in the treatment of nervous and hypochondriacal patients, who believe they must be constantly medicating; and also when narcotics are tending toward a habit. It represents the influence of the mind upon the body; it can be frequently seen that the expected result occurs with a placebo in an imaginative patient quite as well as if the medicine was given. Deception of this kind should not be resorted to except in those cases where the act itself is a remedy, and where it redounds to the welfare of the patient.

All utensils used in giving medicines should be carefully and thoroughly cleansed after each use. In a ward the same glass or spoon must never be used in common unless well cleansed after each use. The best mode of measuring is by a graduated glass. Spoons differ too much in size, and the possibility of heaping them, even with a liquid, makes them uncertain means of measuring. It is better to have the medicine in small bottles, and then measure the dose by the fraction of the whole to be given. Obtain a graduated glass, if possible, and then the doses can be measured

accurately. It is always a good precaution to have some old clean linen or cotton cloths on hand to use in protecting patient's clothing and furniture from being soiled by medicine. The bottle should also be wiped off after use.<sup>1</sup>

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<sup>1</sup> Tables of weights and measures, abbreviations, and the list of common medicines with their doses and effects, will be found in the appendix.

## CHAPTER XXIII.

### FORCIBLE FEEDING ; FOOD FOR THE SICK.

WHEN a patient declines to take food voluntarily because of delusions or a desire to die, or by reason of paralysis of the organs of deglutition, and food is necessary for life and recovery from disease, the question of introducing food into the stomach by mechanical means must be considered.

This artificial or mechanical feeding should never be resorted to if it can be avoided. In any case, it is a question for the physician to determine, but his opinion depends upon the statements of the nurse of her inability to get the patient to take food. Every means should be tried to get the patient to swallow a sufficient amount of nutriment. Patience and skill will very much reduce the number of patients who require tube feeding. Great care must be exercised not to break off teeth in trying to open the mouth. By placing the forefinger inside the cheek and allowing the liquid to run in, swallowing is sometimes excited. If the teeth are out upon one side of the mouth, a small quantity of liquid can be passed through with a feeding cup. Spoon feeding can be tried, in fact, every means should be tried, but if they are unsuccessful then tubal feeding must be resorted to.<sup>1</sup>

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<sup>1</sup> In every case of delusional insanity, where there is refusal of food, before tube feeding is commenced, the patient should

The physician is expected to perform forced alimentation, but it may fall to the nurse's duty when it becomes a regular necessity. In some cases one feeding will cure the patient of resistance. There are other cases where patients seem to like the process, and will help to introduce the tube.

The time a patient should go without feeding depends upon the condition of the patient and form of insanity. In acute delirium or any exhausting form, the time should be short. If the pulse gives indication of exhaustion, measures should be commenced at once. Sometimes patients are admitted to the hospital with the statement that they have taken no food for a week or longer. If their condition corroborates this statement, efforts at getting them to take food should be commenced at once and persisted in, to be followed, if unsuccessful, with tube feeding without much delay.

A very embarrassing situation is where a patient is dying from lack of food, and is yet too weak to be fed forcibly without danger of fatal exhaustion. There are diseases which contra-indicate forcible feeding, such as diseases of the heart and lungs, and pregnancy. The best position for the patient in artificial feeding is the recumbent one, upon the back, the head slightly raised upon a pillow. Everything about the neck and chest should be loosened. A sufficient number of assistants should be at hand, and the most experienced should hold the head with a soft towel wrapped about it. A sheet is thrown across the patient's body and it is drawn snugly over the lower extremities and held

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be left alone with a meal close at hand. Frequently the nurse will return to find the food consumed. It is certainly worth a trial in every case.

there. The patient should never be kneeled upon under any circumstances. An assistant holds the arms at the wrists.

There are two methods of feeding—one by passing the tube through the nose into the œsophagus, called *nasal* feeding; and the other by passing the tube through the mouth. In the latter case the mouth must be kept open by a plug between the teeth. Plugs of hard wood or hard rubber are made screw-shaped, with a pointed extremity, which by turning will gradually pry the mouth open; or it can be kept open with a folded towel, cork, etc. The proper tube to use is of soft rubber and large, with openings upon two sides near the end. Besides the tube, the articles needed are a funnel, or an ordinary bulb syringe, a basin, the liquid food, a glass of water, several towels, and water and soap for the physician.

When the mouth is open and the tongue is depressed, the patient will sometimes swallow if the food is placed in the pharynx. There is some danger, however, that the patient in struggling to expel it may get some of it into the trachea. In passing the stomach tube, the end is dipped in the feeding mixture (which is much better than oiling it). It is then passed with the finger back to the pharynx, over the epiglottis and into the œsophagus, and by slight pressure it passes down into the stomach. If it should not go down easily, inject or allow to flow into the tube, a small amount of liquid, and this will excite the act of swallowing, and the tube will be carried down. About 18 inches should be passed and then about 4 inches withdrawn. The funnel, or the syringe, is then attached to the end of the tube and the liquid is allowed to flow slowly into the

stomach. The tube is then withdrawn and a basin or towel should be ready to catch the end of it. The patient should be kept quiet after the feeding is over to prevent vomiting, and also on account of the shock that always follows in some degree.

If the tube should pass into the larynx, immediate notice will be given by the paroxysm of coughing; also in case the liquid should enter the trachea. In such case remove the tube as quickly as possible and let the patient sit upright.

In feeding by the nose a smaller tube is necessary. The same process is required, but greater care should be exercised when the tube reaches the pharynx, that it does not enter the larynx. It is also better to have the syringe attached to the tube and filled with the liquid or clear cold water. If there is but one opening in the tube, have that directed posteriorly; when the end of the tube reaches the floor of the mouth, squeeze a small amount of fluid out and it will excite swallowing, when the tube can be slipped down.

The use of the nasal tube is indicated in very obstinate cases where the teeth are difficult to separate. It also interferes less with respiration as the mouth is left free for breathing.

Where there is evidence of a foul stomach with loss of appetite, particularly in melancholia, great good is effected by washing out the stomach. The tube is introduced in the usual way, and then by an Allen or a similar pump the stomach is filled with water which is afterwards pumped out. If the liquid is a solution of boric acid, the antiseptic has a happy effect. This is called *lavage*.

The following is an ordinary dietary for forced

alimentation : For breakfast : beef-tea,  $1\frac{1}{2}$  pints ; brandy 2 ozs. ; if necessary, add a laxative and tonic. For dinner the same ; and for supper : milk, 1 pint ; one egg ; extract of beef. If only two meals a day are given, these amounts can be proportionately divided. Koumiss is a serviceable food. Every kind of fluid food can be used, and salt should always be added. It is also a good plan to close the feeding by injecting a small amount of water.

In acute sickness the diet is usually prescribed by the physician. Its preparation is usually left to the nurse, and upon its proper preparation, palatable qualities, and pleasing appearance, may depend the patient's appetite. A particular care of the nurse should be that the suggestion of food should not be made to the patient, either by talking about it or by allowing the smells from its preparation to reach the sick-room, until it is set before him ready to eat, upon attractive dishes, and with clean linen.

Whatever is served should be good. It is better to have the patient do without butter than to have it tainted, and this applies to all food. The quantity of food served to the patient should not be in excess. It discourages the patient to see heaped up dishes. It is also better to give food in small quantities frequently, to the sick.

In private practice the nurse should make suitable preparation for the night food. Ice wrapped in a woollen blanket will keep well, or a flannel covering to the pitcher will help to keep the ice through the night. A temporary refrigerator may be made with a large dish-pan and a smaller pan inside it, upon which the ice is placed. The articles can surround this and the whole



be covered by napkins or a small table-cloth. Food can be heated by an ordinary alcohol lamp in the absence of better means.

A good way to give liquid food to a patient that should not be raised in bed is through a feeding cup with a long curved and closed spout ; or a glass tube may be bent through which the patient can suck the food. Unless the physician gives contrary directions the patient can drink all the water desired. Have the glass perfectly clean and bright. It is much better to have a small glass and fill it than to use a large tumbler partly filled. The approximate amount of food taken should be recorded. If the nutritive value of food could be expressed in units, it would be a simple matter to record the nutrition taken.

A very reprehensible practice is for the nurse to taste the food in the patient's presence, to ascertain whether it is properly seasoned, etc. If any tasting is to be done, it should be elsewhere. The following words from Florence Nightingale cannot be improved upon.<sup>1</sup>

“ With most very weak patients it is quite impossible to take any solid food before 11 A.M., nor then, if their strength is still further exhausted by fasting till that hour.

“ A spoonful of beef-tea, of arrowroot and wine, of egg-flip, every hour, will give them the requisite nourishment, and prevent them from being too much exhausted to take, at a later hour, the solid food which is necessary for their recovery.

“ Again, a nurse is ordered to give a patient a teacupful of some article of food every three hours. Patient's

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<sup>1</sup> *Notes on Nursing*, by Florence Nightingale. London : Harrison Sons.



stomach rejects it. If so, try a tablespoonful every hour ; if this will not do, a teaspoonful every quarter of an hour.

“ In very weak patients there is often a nervous difficulty of swallowing, which is so much increased by any other call upon their strength, that, unless they have their food punctually at the minute, which minute again must be arranged so as to fall in with no other minute's occupation, they can take nothing till the next respite occurs—so that, an unpunctuality or delay of ten minutes, may very well turn out to be one of two or three hours.

“ But, in chronic cases, the consulting the hours when the patient can take food, the observation of the times, often varying, when he is most faint, the altering seasons of taking food in order to prevent such times—all this, which requires observation, ingenuity, and perseverance (and these really constitute the good nurse), might save more lives than we wot of.

“ Exhaustion from a half starvation is one of the most frequent causes of loss of sleep. Many a patient will sleep exactly in proportion as he can eat.

“ To leave the patient's untasted food by his side, from meal to meal, in hopes that he will eat it in the interval, is simply to prevent him from taking any food at all. Patients have been literally made incapable of taking one article of food after another by this piece of ignorance. Let the food come at the right time, and be taken away, eaten or uneaten, at the right time ; but never let a patient have ‘ something always standing ’ by him, if you don't wish to disgust him of everything.

“ That the more alone an invalid can be when tak-

ing food the better, is unquestionable ; and, even if he must be fed, the nurse should not allow him to talk, or talk to him, especially about food, while eating.

“One very small caution : take care not to spill into your patient’s saucer,—in other words, take care that the outside bottom rim of his cup is quite dry and clean ; if every time he lifts his cup to his lips he has to carry the saucer with it, or else to drop the food upon and to soil his sheet, or his bed-gown, or pillow, or, if he is sitting up, his dress, you have no idea what a difference this small amount of care on your part makes to his comfort, and even to his willingness for food.”

## CHAPTER XXIV.

### SPECIAL MEDICAL CASES.

THE art of nursing includes certain rules that are applicable to all the sick, and by "nursing" is meant the care that a sick person needs whatever the malady, not only for the relief of discomfort as far as circumstances will permit, but as an aid to recovery. There are special diseases, however, that demand the attention and care of a nurse in addition to the general nursing requirements. A nurse should also be prepared to recognize and meet temporarily complications that may arise in special diseases.

*Typhoid fever* is an infectious disease, and the most common of the continued fevers. It is caused by a germ<sup>1</sup> (typhoid bacillus) that is usually taken in food or drink. It begins very insidiously, by a feeling of fatigue (malaise), headache, chilly feeling, loss of appetite, and sometimes diarrhœa. This may last for five or six days before the fever is very noticeable; but from the first there is a rise in the evening temperature, which increases as the disease progresses. At the end of the first week the evening temperature may reach 104° F., where it may remain with some varia-

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<sup>1</sup> It is still held by competent authority that typhoid fever may also be caused by a miasm, or a non-bacterial poison, but the vast majority of medical opinion holds the contrary view.

tion for ten days or longer. With the increase in fever, there is an increase in the intensity of all the symptoms. There may be a troublesome cough, and even at the outset this may lead to the suspicion of lung trouble. From the seventh to the twelfth day a rose-colored rash appears,<sup>1</sup> the headache continues, the bowels are usually loose (sometimes constipated), the patient has a haggard, "typhoid" appearance, the prostration is great, and the mind is dull. During all this time there is an increasing inflammation and ulceration of Peyer's patches and of the solitary glands of the small intestine. *Sordes* is an accumulation of dark, foul matter upon the teeth, lips, and tongue, which occurs in this disease as in all acute fevers. The nurse can do a great deal towards preventing sordes by washing out the mouth after taking food with an antiseptic solution (boric acid), by wiping off the teeth frequently, and by moistening the lips. For this purpose pledgets of absorbent cotton or small pieces of soft muslin can be used, which should afterwards be burned.

The stools should be watched to see if there is any change in their character. Typhoid stools have a "pea-soup" appearance. In case of constipation the bowels should be opened by enemata and not by laxatives, as the inflamed mucous membranes must be relieved from all possible irritation. Towards the close of the third week the prostration becomes greater and the pulse more feeble. Exhaustion is now the

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<sup>1</sup> This rash is very uncertain, and in some cases it is difficult to discover. The spots are rose-colored and disappear upon pressure, to return when the pressure is removed. They last about three days.

dangerous feature, and there may be a low, muttering delirium. Hæmorrhage of the bowels is a complication that should not be unexpected after the second week, and the first indication of it is collapse with a sudden fall of temperature ; there may be a stool composed of blood. Treatment of this condition is described elsewhere ; but is, in brief, absolute rest upon the back, a low head, and ice to the abdomen. The intestine may be perforated, and this is the great danger in typhoid fever. In this calamity there is severe pain added to the collapse, with symptoms of peritonitis, swelling of the abdomen, etc. Any sudden change in symptoms in typhoid fever should be at once reported to the physician. If the case proceeds favorably, there should be a continuous improvement from the fourth week. The appetite returns and becomes voracious. One of the difficulties of the nurse is to restrict the patient to a conservative diet, which is usually milk during the period of fever. This is given in small amounts and frequently (three fourths of a tumblerful every two hours), so that about two quarts may be taken in the twenty-four hours. In addition to milk, as convalescence approaches, mutton- or chicken-broth and beef-tea may also be given, but solid food must never be given until the physician orders it. The patient may be allowed plenty of water, or lemonade and iced drinks.

Typhoid fever being an infectious disease, the rules for disinfection must be fully carried out in its treatment. The utensils used for a typhoid case must not be used elsewhere. Although the dejections from the bowels are the only source of contagion in typhoid fever, care must be taken with all matter that comes in con-

tact with the patient. It is the stools particularly that need to be disinfected. Bed-sores occurring in a typhoid case are evidence of poor nursing. Much can be done for the comfort of the patient by the efficient nurse. In fact, there is no disease in which good nursing is of more importance.<sup>1</sup>

*Typhus fever*<sup>2</sup> is rare now-a-days, for the reason that the rules of health (hygiene) are more carefully observed. It is a disease of starvation—of the lungs or stomach. The effort in nursing is to keep the patient's strength up until the disease has run its course. The patient must be carefully watched during the delirium. Cold to the head is useful. Ventilation is especially important. Infection is in the breath in typhus, and the nurse must see that the air in the sick-room is changed frequently. The nurse must keep up her own strength and eat liberally, as this is the best preventive. The strictest disinfection must be observed.

*Malaria* is an infection giving rise to several types of fever, which are termed intermittent fever,<sup>3</sup> remittent

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<sup>1</sup> The head symptoms and sleeplessness are sometimes relieved by ice compresses to the head. A delirious patient sometimes becomes active and apprehensive and endeavors to escape out of the window ; while in delirium the patient must be watched closely.

<sup>2</sup> Also called *ship fever*, *camp fever*, and *jail fever*. Symptoms are for a day or two weakness, headache, loss of appetite ; then a chill followed by a high temperature ; tongue whitish ; bowels costive. Delirium begins early and is violent. The temperature reaches 106°-7° F., after the third day. The head symptoms are much greater than in typhoid, and muscular weakness is extreme. A rash appears (mulberry rash) the first week, of dark red or purplish spots. Duration of an attack is usually three weeks. The critical period is about the eleventh day. It changes for the better abruptly.

<sup>3</sup> Also called *ague*, and *chills and fever*. It has three stages known as the cold, the hot, and the sweating stage. Cold stage begins with languor or yawning and a sensation of coldness,

fever,<sup>1</sup> and pernicious fever.<sup>2</sup> The symptoms may be treated thus: in the cold stage, hot articles can be placed at the extremities; cold compresses to the head for pain; lemonade or iced water for thirst; tepid sponge bath for the fever, etc. The clothing and sheets should be changed after each sweating stage, and the patient's skin should be cleansed. In the severe forms careful attention must be given to the diet, and particular care must be given in the administration of remedies.

*Asiatic cholera* <sup>3</sup> is due to a germ. It is therefore an infectious and contagious disease and the contagion is chiefly in the stools. It is usually epidemic and spreads very rapidly. The most careful and exact dis-

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which soon develops into a chill. There is thirst and sometimes vomiting. It may last from 10 minutes to 2 hours. Then warmth returns, the face flushes, the heat increases, the mouth becomes dry, and headache is violent. This condition may last from 1 to 18 hours. This is followed by sweating and increased comfort. The patient often goes to sleep sweating profusely. The fever disappears. In *dumb* ague there is no chill. Following this sweating there may be a return to health, but after a certain interval, which may be one, two, or four days, there will be a repetition of the symptoms. If not properly treated it may last several weeks.

<sup>1</sup>This is also called *bilious fever*. It is characterized by changes similar to intermittent fever, but there is no complete disappearance of symptoms in the interval. The symptoms improve and the patient becomes more comfortable until the next attack comes on. In this form there is some jaundice which gives it the name of bilious.

<sup>2</sup>*Pernicious* fever is a malignant form of remittent. It is also called *congestive* fever. It usually begins like the other forms, but in several days all the symptoms become intense; the skin becomes shrunk and clammy; the countenance anxious; the tongue pale; thirst is intense; the stomach is irritable; vomit may be bloody; bowels are loose; pulse is weak and irregular; respiration is sighing. Without proper treatment death is usual, but with proper treatment only one in ten die.

<sup>3</sup>Also known as *epidemic cholera*. The symptoms begin with a painless, watery diarrhoea which increases and is soon followed



infection must be practised, especially of the stools and clothing ; and during the prevalence of the disease, everything taken into the stomach should have previously been boiled. In treatment the first effort should be to lessen purging and to support vitality. Opium is given for both purposes ; hot applications to the abdomen and heat to the whole body are advised ; give ice, but little water ; warm, astringent injections (tannic acid) are useful. If a nurse takes proper care of the food she takes, and keeps scrupulously clean, there is not much danger in nursing cholera cases.

*Smallpox (variola)*<sup>1</sup> is one of the most severe and contagious of diseases. Before vaccination was introduced thousands died annually from it. The poison is present in all the secretions and is given off chiefly by

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by vomiting. The discharges are named from their appearance "rice-water." The skin grows cold ; the limbs are cramped ; prostration is very great ; thirst is intense ; breathing is oppressed ; the voice is lost or much changed, and the collapse ends in death. Or reaction may take place and the symptoms will gradually disappear. The common *cholera morbus* when severe, may resemble cholera. Cholera morbus is caused by some irritation in the alimentary canal, and cholera is a poisoning of the system. Neither is the former epidemic.

<sup>1</sup> There are five stages : incubation, primary fever, eruption, secondary fever, desquamation. The incubation which is the time between exposure and the beginning of disease, is about twelve days. The first symptoms are languor, headache, vomiting, and *severe pain in the back*. On the third day small red pimples appear, first on the face, then on the neck, arms, trunk, and lower limbs ; these change to vesicles, then to pustules on the ninth day. Then they flatten and scab. Five days later (14th day), the scabs fall off. The amount of the eruption determines the severity of the disease. It is called *discrete* when the vesicles are scattered ; when they run together it is called *confluent*. The secondary fever occurs when the eruption is fully developed (11th day). A peculiar odor emanates from the body. *Malignant* smallpox is a very violent form of it. Delirium is a common symptom and stupor (coma) may supervene.

the skin. The greatest danger is when the vesicles begin to suppurate. The best ventilation must be maintained in the sick-room and the temperature of the room should be maintained between 60° and 70° F. The diet should be light but supporting. Hot fomentations or sponging relieves the pain of eruption, and bathing or sponging is admissible for the reduction of fever. The vesicles that are very prominent may be relieved by pricking, and the face can be covered with lint saturated with a weak carbolic acid solution. Apply cold for head symptoms. When desquamation begins, the skin should have an application of some oily substance (vaseline) to prevent the scales from scattering, and baths should be given frequently. The patient must be promptly and strictly quarantined. Contagion is possible as long as any of the old skin remains upon the patient. The odor can be neutralized by antiseptic washes. All dressings used about the patient must be burned. When a case of smallpox appears, all members of the family should be vaccinated, as well as the nurse. *Varioloid* is a modified form of smallpox, which affects those who have once been vaccinated.

*Erysipelas* <sup>1</sup> is an acute infectious disease caused by bacteria. The patient must be quarantined and the

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<sup>1</sup> Also called *St. Anthony's fire* and *rose*. It may be local or general. It often begins with a chill followed by fever. The eruption usually begins on the face, with redness, some swelling and soreness to the touch; it spreads gradually and may extend almost all over the body. The inflammation may be superficial, affecting only the skin; or deep, extending to the tissues beneath the skin, and cause suppuration and abscesses. If the scalp is affected there is usually some delirium, and inflammation of the brain may follow. Traumatic erysipelas follows a wound.

usual precautions taken for disinfection. In hospital wards it may attack wounds after operation, or any unnoticed abrasion of the skin. The diet should be light and supporting. Mild emollient applications can be made locally.

*Septicæmia*<sup>1</sup> is an absorption of pus into the circulation. The treatment is to support the vitality in every way, by concentrated liquid food ; milk and lime-water for vomiting. Abundant ventilation is necessary.

*Pyæmia* is also caused by absorption of purulent matter, but the disease is not as virulent or rapid as septicæmia, and abscesses form in various parts of the body. It is characterized by a peculiar uneven fever, with great changes in evening and morning temperature.

*Rheumatism*<sup>2</sup> is an acute fever caused by exposure to cold and damp. It may also be developed from other causes—poor living, malaria, etc. Warmth should be applied, and the inflamed joints can be wrapped in cotton-wool. The diet should be light, and stimulants should not be given. The urine should be tested frequently to discover the reaction (alkaline or acid).

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<sup>1</sup> Or blood poisoning ; is accompanied with chills, fever, rapid pulse, vomiting, delirium, and great prostration. It follows absorption from suppurating surfaces in the pelvic cavity or elsewhere, and sometimes after childbirth.

<sup>2</sup> Called *inflammatory rheumatism*, or *rheumatic fever*. It is based upon a constitutional tendency called the *rheumatic diathesis*. It is characterized by a high fever with severe inflammation of several joints, which one after another become hot, red, tender, and swollen. The shoulders, wrists, ankles, and knees are most frequently affected. The pulse is full and rapid ; the skin is bathed in perspiration ; and the urine is scanty, high-colored, and acid in reaction. The duration is uncertain, but it usually lasts for several weeks, sometimes for several months. The chief danger in rheumatism is in the liability of the inflammation affecting the heart. With this exception it is not a dangerous disease.

Cold applications must not be made to the joints, or no effort made to dissipate the inflammation for fear of its going to the heart membranes.

*Dysentery*<sup>1</sup> is an inflammation of the lower bowel. It is a sort of a catarrh and is sometimes called acute catarrhal dysentery. The patient should be kept in bed and be given a milk diet. If the stools are very frequent, the milk may be boiled, or a porridge of baked dry flour and boiled milk given. Beef-juice is also appropriate. A broad flannel binder about the abdomen, or a turpentine stupe is sometimes comfortable. Instruments and clothing should be disinfected. Starch and laudanum enemata relieve the tenesmus; as do also iced compresses to the anus.

*Peritonitis*<sup>2</sup> is an inflammation of the peritoneum. If an operation upon the abdomen should admit infection, peritonitis follows. The greatest quiet must be observed by the patient, and she must not be moved

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<sup>1</sup> It may be acute, chronic, epidemic, or tuberculous. The symptoms are pain in the lower part of the abdomen, with tenderness upon pressure; frequent stools, the small, bloody, and mucous passages accompanied with great tenesmus (straining) and griping. There is fever in acute cases. It is a prostrating disease and death sometimes results from exhaustion. In asylums it occasionally becomes epidemic and carries off many of the older and feebler patients. Duration is from five to twenty-one days.

<sup>2</sup> The *peritoneum* is the serous membrane lining the abdomen and enclosing the intestines and all the abdominal viscera. The inflammation may be simple or idiopathic, traumatic, tubercular, or puerperal. It is caused by exposure to cold and wet; by falls, blows, wounds; or by perforation of the stomach or intestines (as in typhoid fever). It begins with abdominal pain and tenderness, increased by movement, or even by breathing, or by raising the lower limbs; vomiting, constipation; tympanites; fever, and with a very rapid but not a full pulse. There may be delirium followed by collapse. It runs a short course, and death may occur in several days, or recovery by gradual subsidence of the symptoms.

or allowed to sit up. The pressure from bedclothes can be relieved by a "cradle" or loops placed over the body. Hot fomentations may be ordered. If poultices are used, they should be light and changed very frequently. The diet will be directed by the physician.

*Appendicitis* is an inflammation of the vermiform appendix, and there may be an extension of the inflammation to the peritoneum or by perforation. The chief symptom is severe pain in the right lower part of the abdomen with some fever, vomiting, constipation, and tenderness. Application of ice is the only thing the nurse can do. It often requires an operation.

*Bright's disease*,<sup>1</sup> or inflammation of the kidneys is of several forms. It follows some of the acute diseases, or may come on after exposure to cold; or after the

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<sup>1</sup> This disease is indicated by *albumen in the urine*. In the acute form, the patient after exposure is seized with chilliness, headache, nausea, vomiting, pain in the back and limbs, dry skin, oppression of respiration. Fever follows and the body swells with dropsy. The urine is scanty, heavy, acid, and dark from the presence of blood, and there is a large amount of albumen in it. There is a tendency to pass the urine frequently. Upon letting it stand, there is a deposit. From one to three weeks determines the termination, which is death, recovery, or the disease becomes chronic. If death results, it is from *uræmia*, or the poisoning of the system through the retention of the urea, which the diseased kidney has not been able to separate from the blood; or it may occur from some other disease intervening, such as pneumonia, pleurisy, peritonitis, etc. About two-thirds of the cases recover.

Chronic Bright's disease comes on so slowly that it is seldom detected until months or years have elapsed. It is a very common disease and seems to be increasing in frequency. Gradual loss of strength, a paleness and a puffiness of the face, difficulty in breathing, and a frequent tendency to pass the water are among the earliest signs. Even these symptoms may be slight. The first notice of the disease may be a convulsion or some local inflammation. Examination of the urine then gives the character of the trouble, for albumen will always be

use of some drugs, such as cantharides or turpentine. The purpose of treatment is to make the skin and bowels do what the kidneys cannot do ; hence they should be kept active. Hot vapor baths are ordered, diuretics<sup>1</sup> and diaphoretics<sup>2</sup> are given, and plenty of drink. The diet must be carefully regulated, so as not to disturb digestion. The daily amount of urine passed should be measured and noted, and a sample kept for each visit of the physician.

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present. The nurse should understand how to make accurate tests for albumen, as she may be called upon to do so at times when the knowledge is indispensable.

There are several methods of testing for albumen, but the one chiefly used is the *heat and nitric acid* test. Filter the urine through a pledget of absorbent cotton. Fill a test tube half full with this filtrate and boil it. This will coagulate the albumen (turn it white) and precipitate it. Add a few drops of nitric acid and if it does not dissolve the precipitate then it is albumen. Another method is to make the urine acid with a few drops of acetic acid, and then apply the heat to the upper part of the liquid to boiling, when the albumen will appear. Still another test is known as *Heller's test*. Put a drachm of nitric acid in a test tube, and let the urine trickle by drops down the side of the tube ; if a white ring forms where the urine touches the acid and remains after heating, it is positively albumen.

As chronic Bright's disease progresses, it presents a great variety of symptoms. Besides albumen in the urine, there may be general dropsy of the cavities (abdomen and chest), and swelling of the feet and legs ; indigestion ; headache ; dizziness ; impairment of sight ; convulsions ; vomiting ; diarrhœa ; bronchitis (very common) ; heart disease ; and inflammation of other organs (secondary inflammations). There may be intervals of improvement with relapses, but each time the patient is a little worse. The disease may go on in this way for years. The disease sooner or later is sure to have a fatal result. When a dropsy that comes on slow or irregular is combined with albumen in the urine, it is surely Bright's disease. If the deposit of the urine is examined under the microscope there will also usually be found casts of the smaller tubes of the kidney.

<sup>1</sup> Medicines to excite the secretion of the kidneys.

<sup>2</sup> Medicines to excite the secretion of the skin.



*Diabetes*<sup>1</sup> is a systemic affection causing an excessive discharge of urine containing sugar. It comes on gradually. The chief treatment is the regulation of the diet, and the avoidance of food containing sugar and starch. The patient must have a list of articles he cannot eat. Therefore all bread, except bran, and nearly all vegetables are prohibited. Skimmed milk is allowable. Exercise should be well regulated, and the clothing should always be warm. Restricting the water taken has no advantage.

*Gastritis*<sup>2</sup> is an inflammation of the stomach membranes. The treatment is the careful regulation of the food taken, usually fluids only; and sometimes rectal alimentation must be resorted to. Counter-irritation over the stomach, swallowing of small pieces of ice, lime-water and milk, are useful.

*Dyspepsia* is a general term applied to indigestion,

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<sup>1</sup>This is also called *glycosuria*. It is more frequent in men, and in the young and middle-aged; and in cities than in the country. It begins slowly, and the first notice usually given is the great amount of urine passed, and the constant thirst, and sometimes an excessive appetite; there is a constant loss in weight; the skin is dark and harsh; the tongue shiny and furrowed; the mouth clammy; a failure in the mental powers; there is sometimes neuralgia. Later the symptoms are like those of pulmonary consumption. The detection of sugar in the urine settles the diagnosis.

The specific gravity in the urine is much increased. To test for sugar (Trommer's): add to  $\frac{1}{3}$  test tube of urine  $\frac{1}{3}$  of its quantity of liquor potasse; then add by drops a ten per cent. solution of sulphate of copper until a precipitate forms, then boil. Sugar will be shown by a red precipitate. The fermentation test is by putting a small bit of baker's yeast in a test tube full of urine, which is then inverted over some quicksilver. If sugar is present, the urine will be forced out of the tube by the gas formed.

<sup>2</sup>Very often caused by corrosive poisons. The signs of stomach inflammation are great pain and tenderness over the stomach, vomiting of everything swallowed, and fever.



either in the stomach or intestines. The patient is always conscious of his stomach. Sometimes the pain is over the heart, leading to suspicion of heart disease. The bowels are constipated. The regulation of the diet is the most important element of treatment. The cause of dyspepsia must be removed. Regular habits and plain diet are imperative.

*Pneumonia*<sup>1</sup> (croupous) is an acute inflammation of the substance of the lung, and is infectious. The great object of treatment is to support the strength and tide the patient over the disease. Everything to save vitality should be tried—perfect quiet, careful ventilation, nourishing but liquid diet, and stimulants at the proper time.

*Pleurisy*<sup>2</sup> is an inflammation of the serous membrane lining the cavity of the chest and surrounding the lungs. A “stitch in the side,” with fever, should al-

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<sup>1</sup> It may be single or double, that is, affecting one or both lungs; or lobular, affecting only one lobe. A chill followed by fever with oppressed breathing and a dull pain in the chest, are the first symptoms. A short cough also occurs. Delirium is common. The urine is scanty and high-colored. At first the expectoration is scanty, and it has a characteristic rusty color. The doctor should see the sputa. The prostration is very great, supposed to be due to the deterioration of the blood. It is divided into three stages; engorgement; consolidation; resolution, or suppuration. The causes of the disease are a lowered vitality from any cause (predisposing) and exposure to the infection (exciting).

<sup>2</sup> Like pneumonia it may be single or double. Generally after a chill there is a sharp pain in the side with difficulty in drawing a long breath, and a sharp cough. The pain is sometimes intense. If the disease goes on, *effusion* may occur; which is a pouring out of serum into the pleural sac. This is sometimes so great as to compress the lung and render it useless. If this fluid should become purulent, it is called *pyo-thorax*; if it remains serous, it is called *hydro-thorax*; if air gains an entrance into the pleuræ it is called *pneumo-thorax*. Sometimes the inflammation passes away without any effusion.

ways lead to suspecting it. The treatment is absolute rest, and the most favorable position to save pain. The diet should be light but nutritious. Counter-irritants are sometimes used, and if the chest is supported with a broad bandage it gives relief.

*Pulmonary tuberculosis*,<sup>1</sup> or *phthisis* is a disease caused by the deposit of tubercles in the lungs. It is an infectious disease, but predisposition, either inherited or acquired, has much to do in causing it. The infection seems powerless in a body not predisposed to it. Change of climate, out-of-door occupation, warm clothing, nutritious and fattening food, carefully regulated exercise, are features of treatment. A high altitude and a dry atmosphere are favorable to recovery.

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<sup>1</sup> Commonly called *consumption*. It may begin after pneumonia, bronchitis, or any acute disease, or more gradually. There is first a slight hacking cough; or there may be a hæmorrhage as a first indication. There is usually dyspepsia and a loss of weight from the first. Later there are pains in the chest, frequent and severe cough, and in about two-thirds of the cases hæmorrhage, paleness of the skin, rapid pulse, a hectic fever, emaciation, night sweats, and sometimes a troublesome diarrhœa. The spirits of the patient are usually cheerful and hopeful, and this is the characteristic mental condition.

## CHAPTER XXV.

### CHILDREN'S DISEASES.

*Infancy* extends from birth until the completion of the first dentition, or about  $2\frac{1}{2}$  years; and *childhood* from infancy to puberty, or to fifteen years. These periods are subject to diseases that do not attack the system in other periods of life but very seldom.

The bones in the young are in process of development, and contain a relatively larger amount of organic matter than in adult life. Anything interfering with the nutrition of bone development causes serious deformity, as the shape of the body depends upon the bones. *Rickets* (*rachitis*) is the common disease affecting the bones, although it is constitutional; it is characterized by a lack of lime in the system. The causes are poor living, bad air, and unwholesome food.

The child is feeble and irritable, and usually has an enlarged head and puffy abdomen. The legs may be bowed or knock-kneed. It is necessary in infancy that the child should be held properly, and that the general condition be improved by hygienic surroundings and wholesome food.

*Hydrocephalus*<sup>1</sup> is another disease due to inherited

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<sup>1</sup> Water in the head and dropsy of the brain are other names. Infants are sometimes born with it. The symptoms, in addition to the size of the head, which may be enormous, are strabismus (cross-eyed), convulsions, and general languor. They usually die in a few months, but may live for years.

defect or imperfect living. Treatment is of little avail, yet by keeping the kidneys acting freely, and by sustaining the strength with the most nourishing food, relief is sometimes obtained.

*Acute meningitis*<sup>1</sup> occurs chiefly in children under five years of age. It may occur suddenly, the first notice being a convulsion, or may come on gradually, oftener the latter. The child should be kept very quiet in a dark room with the head elevated. The bowels should be kept freely opened. Cold compresses to the head, and light liquid diet given with regularity, is the chief treatment.

*Infantile paralysis*<sup>2</sup> is a disease of the spinal cord. The bowels always require attention, and when the fever is reduced, passive movements and massage of the affected muscles are important. Fresh air and nutritious food are requirements.

*Cerebro-spinal meningitis*<sup>3</sup> is an acute infectious dis-

<sup>1</sup>The symptoms are emaciation, poor appetite, nausea, fretfulness, intolerance of light and sounds, rigidity of muscles, convulsions.

<sup>2</sup>This is a partial paralysis commencing with moderate fever, nausea, and vomiting. There may be individual muscles affected with atrophy. Sensation is not disturbed.

<sup>3</sup>This is also called *spotted fever*. The attack is sudden, with chills (in children convulsions), terrible pain in the head and down the back, and vomiting. Delirium and coma follow quite rapidly in severe cases. The characteristic attitude (Fig. 38) is the bending of the head backwards (opisthotonus) so that the child's forehead sometimes rests upon the pillow. There is hyperæsthesia of the whole body, and the symptoms are



FIG. 38.—ATTITUDE IN CEREBRO-SPINAL FEVER.

those of acute meningitis.

ease, usually epidemic. Ice to the head, a dark, quiet room, freedom from excitement of all kinds, no visitors, a light but nutritious diet, opening the bowels, sometimes counter-irritation to back of neck, are among the indications for treatment. Dry or wet cups to back of neck are sometimes ordered.

*Measles*<sup>1</sup> is common to childhood although not confined to it. No matter how slight the attack, the child should be kept in-doors and in bed upon a restricted diet, until the fever has disappeared. The hygiene of the room should be perfect. The bowels need laxatives. If the rash does not appear well, a hot bath may be useful, afterwards enveloping the child in flannel. The eyes should be protected from a strong light. During desquamation the skin may be rubbed with vaseline and a warm bath given daily, but care must be taken that the patient does not chill. Pneumonia is the most serious complication. Measles is very contagious, and all the precautions for infection should be taken.

*Rötheln*, or *German measles*<sup>2</sup> is a very contagious disease, but it is not followed frequently by complications. Laxatives for the bowels and a light diet, in a temperature not too warm but even, is all the treatment necessary.

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<sup>1</sup> Also called *rubeola*. After an incubation of ten days or more from exposure, the attack begins with chilliness passing into fever. The symptoms are those of an ordinary "cold in the nose." On the fourth day the rash begins on the face and extends over the body. It is a dark eruption which takes the form of a crescent. It lasts several days and then fades at the same time the fever disappears. Desquamation then occurs. Sometimes diarrhoea comes on at this time. The complications of measles are more serious than the disease. There may be inflammation of the eyes, bronchitis, or inflammation of the ear.

<sup>2</sup> This appears to be a hybrid between scarlet fever and measles. The initial symptoms resemble measles.

*Scarlet fever*<sup>1</sup> (*Scarlatina*) is one of the most serious of childhood's diseases. It is contagious and chiefly so during the period of desquamation, hence care should be taken that the peeling skin should not be scattered about; this can be prevented by the same precautions given for measles. At this time, also, exposure to cold is likely to set up an acute inflammation of the kidneys, and the greatest care must be taken to prevent exposure. The patient should be strictly quarantined, and the same care taken in the preparation of the sick-room as for other infectious diseases. For the high fever, cold baths are recommended or the cold pack. Water may be given freely and cold milk may also be given to allay thirst. As in measles, inflammation of the middle ear (otitis media) sometimes occurs as a troublesome complication. Children should be well guarded until the new skin becomes well inured to the atmosphere. Nutrition should be good and the patient should be checked from over-exertion and kept from excitement.

*Chicken-pox*<sup>2</sup> is a mild contagious disease. The only

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<sup>1</sup> After an incubation of about five days there is lassitude, loss of appetite, headache, pains in the back and limbs, followed by fever. On the first day (this may be the first symptom) the throat is sore. Usually on the second day a punctated red eruption appears upon the face and neck, and in half a day has covered the whole body. The eruption is a bright scarlet, and has a swollen appearance and is hot (105° to 106° F.). There is a sense of burning or soreness of the skin. The tongue has a strawberry appearance. The throat is very red and swollen. The pulse is rapid, thirst great, perhaps convulsions, and occasionally vomiting. Following the eruption the skin peels off.

<sup>2</sup> Also called *varicella*. An incubation of four or five days from exposure is followed by an eruption of pimples, which become vesicles (blisters) upon the second day, filled with lymph. In about three days they scab, then dry and fall off, without leaving pits. There is very little fever, and the disease is not dangerous.

attention needed is isolation of the patient, who should be kept in a uniform temperature upon a light diet. A warm bath is admissible.

*Mumps*<sup>1</sup> is a mild contagious inflammation of the parotid glands. The bowels should be moved, a light diet given, and hygienic surroundings maintained. Warm fomentations will relieve the local distress.

*Whooping-cough*<sup>2</sup> is a contagious disease of childhood beginning like an ordinary catarrh. Mild cases need only care to avoid exposure to damp and cold. Good nourishment should be given and out-of-door exercise after the fever has passed; the bowels should be kept open. Inhalations of steam are useful.

*Diphtheria*<sup>3</sup> is a very infectious disease, now believed to be caused by a germ (the Loeffler bacillus). The

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<sup>1</sup> Or *parotitis*, is usually of a few days' duration. One parotid gland swells and becomes hot, painful and tender to the touch. Swallowing may be painful. There is slight fever and some malaise. The opposite gland may swell as the other declines. Very rarely the glands suppurate.

<sup>2</sup> Also called *pertussis*. After an incubation of six days the attack commences with a severe cold, cough, and fever. Soon the cough becomes paroxysmal and the peculiar "whoop" is heard in about ten days. The patient may seem perfectly well between the paroxysms, which come on with a sensation of oppression, followed by a cough which lasts sometimes for several minutes, and is so rapid that when air is taken into the lungs the peculiar sound is produced. It lasts from *one to three months*.

<sup>3</sup> Also called *putrid sore throat*. The early symptoms in the mild form are lassitude, a sore throat, and swelling of the glands behind the jaw, with fever. The fauces, palate, and tonsils are very red and swollen, and on the second day there will be a yellowish-white membrane over the tonsils. There will be an abundant discharge from the nostrils. If the membrane extends to the larynx there will be symptoms of croup, with the barking cough and whistling respiration. Death may occur by asphyxia within a few days. The malignant form commences with intense symptoms, followed early by great prostration, and possibly hæmorrhage from the nose and mouth.



discharges from the mouth and nose carry the infection, and the greatest cleanliness and antiseptic care must be given in this disease. An abundance of cloths should be provided, to be burned immediately after use. The nurse should not draw a breath while working about the face. As this disease is followed by rapid prostration, the strength must be supported by concentrated diet and if necessary stimulants. It is now treated by antitoxin, which is an inoculation of a modified poison that neutralizes the poison generated by the germ.

*Croup*<sup>1</sup> is a common affection of childhood, in the spasmodic form, and although the symptoms are alarming it is not dangerous. The best treatment during the paroxysm is hot fomentations to the neck, or preferably a sponge wrung out of very hot water, large enough to enclose the neck. Hot mustard foot-baths, hot baths, steamed air to breathe, and an emetic of ipecac are effective remedies. The attacks may be prevented by keeping the bowels open and by giving an expectorant. True croup and diphtheria are not easy to distinguish, therefore until the diagnosis is made the patient should be quarantined. The air should be kept

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<sup>1</sup> *Spasmodic croup* arises from an irritation of the bronchial tubes, or it may have a nervous origin. It is also called "false croup." It is not dangerous. It usually comes on in the night, the child giving some indication in the evening by a hoarse, dry cough. The child suddenly wakes in the night with a spasmodic effort to breathe, and it appears as if suffocation would ensue; but suddenly the spasm ceases and the child breathes freely, and falls to sleep. These may occur several times during the night.

*True, or membranous, croup* is an inflammation of the bronchial tract, with the exudation of a membrane. This gradually increases until it closes up the air passage and suffocates the patient. Sometimes it is thrown off by a violent fit of coughing. It is a dangerous disease, but is fortunately rare.

as moist as possible, and boiling lime-water is useful ; nutritious food, plenty of drink, stimulants if necessary, are measures. It is often *necessary to perform tracheotomy or intubation.*

*Colic* is a common symptom in infants, the result of indigestion. Hot dry fomentations and rubbing of the abdomen are useful. Give a little peppermint water, but never give soothing cordials, as they usually contain opium.

*Diarrhœa* is usually a summer complaint, and it has been so-called. It is chiefly a trouble of infancy, and is due to irritation in the alimentary tract. Sterilization of food and perfect cleanliness are the best preventives. Prevent fermentation in the intestines and as a rule you prevent diarrhœa. The treatment should be to clear out the offending matter with as little irritation as possible. Castor oil is the remedy par excellence. If an alkali is needed, calcined magnesia is good. Warmth to the bowels and flannel binders are soothing. Never give paregoric or opium in any form without the physician's directions.

*Cholera-infantum* begins with violent symptoms, the vomiting being associated with diarrhœa. The stools are thin and watery ; there is considerable fever, and the prostration is great. Collapse may come on in a few hours in severe cases. Emollient enemata, water or cold barley-water to drink, warmth to the abdomen, perhaps half a teaspoonful of brandy if the prostration be extreme, can be tried.

The *eyes*<sup>1</sup> in infants, especially the new-born, require

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<sup>1</sup> *Ohpthalmia neonatorum* is a purulent inflammation of the conjunctivæ of the eyes, and is caused by infection. In the new-born child the eyes are infected at the time of birth by the

the utmost care and watchfulness to prevent specific inflammation. When once it is started it is difficult to control. Sometimes the infant is born with an inflammation in progress, especially if labor has been long. The care of the infant's eyes should be the same whether there are indications of redness or not. In bathing the eyes, separate the lids without friction and while open let a clean, warm two per cent. solution of boric acid trickle over the eyeball. They must not be rubbed, but an ordinary medicine dropper can be used to syringe them out. If they are inflamed then they should be cleansed hourly at least, and oftener if necessary. Catch the solution with a pledget of absorbent cotton as it runs down the face. Burn the dressings, disinfect hands and everything used, and the nurse should be careful of her own eyes. This is especially a disease of the unwashed.

A troublesome disease of infants is *thrush*<sup>1</sup> affecting the mouth and gums. The mouth becomes painful and sometimes the child refuses food for this reason.

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discharges of the mother, but after birth the germs may be introduced by carelessness and uncleanness. A simple inflammation may follow exposure, afterwards becoming purulent. The danger from any form is the rapid ulceration of the cornea of the eye, leaving opaque spots, which if in front of the pupil interfere with sight. The first symptoms are a slight redness of the lids about the edges and some swelling. The swelling increases so as to close the lid completely and the pus trickles out.

<sup>1</sup> Also called *sprue* and *muguet*. After a day or two of diffused reddening of the tongue and mucous membranes, a number of small whitish points appear, which unite and form patches of curd-like matter. In severe cases they are brownish. The mouth is hot and the stomach disordered. There may be vomiting, diarrhoea, and slight fever. The attack lasts several weeks, but is not dangerous except in weakly children very much run down.

Each time food is taken the mouth should be washed out. If a solution of borax (3 i to aquæ 3 iii) is applied every two or three hours with a pledget of absorbent cotton, it will improve the condition. An eruption about the anus at the same time indicates the same condition throughout the alimentary canal, and is very serious.

*Constipation* in infants is sometimes exceedingly obstinate and difficult to overcome. When not dependent upon some obstruction or displacement, it is usually remedied by a change in diet. A suppository cut out of soap is sometimes efficient, but this should not be continued long enough to become a habit. Light massage of the bowels, adding oil before it, is occasionally beneficial.

*Teething* in infants gives rise to some functional disorders, especially of a nervous character, and may even cause convulsions. The nurse should understand that teething itself, which is a physiological process, is not responsible for any disease, but occurring at the time of some other disorder, it adds to the irritation. There is usually a fretfulness at this time and some fever; there may be digestive trouble, or diarrhœa. Good hygienic conditions are the indications.

The qualities that make a nurse efficient for sick children are patience, tact, comprehension of the child's unspoken wants, and a proper judgment. Subjective symptoms in children go for naught, and in this respect their care requires the same qualities as for the insane. There are speechless means of communicating, which the observant nurse will soon interpret. The attitude, cries, facial expression, surface indications, etc., all speak of the condition within, and the

nurse in the absence of the physician, must be the interpreter. Children soon learn their friends, and the unsympathetic nurse will have a hard time with a child if the child finds her out. Cheerfulness and gentleness will do more than strict requirements. Threats should never be resorted to, even jokingly. Find out the "bent" of a child, and use it to accomplish the purposes of nursing. The successful nurse will do this naturally, and without making any especial effort, the nurse and patient will soon become chums.

## CHAPTER XXVI.

### CONVALESCENCE ; SIGNS OF DEATH ; CARE OF THE DEAD.

WHEN a patient is in the acute stage of disease and is wholly dependent upon the nurse, the latter's word is law and she experiences little trouble in carrying out the directions of the physician. When recovery sets in and the patient feels the returning vitality, gaining with it desire for action and more or less independence of opinion and will, the nurse's difficulties may increase.

The tendency to visit convalescents must be checked, even at the risk of offense. Neither the patient nor the friends realize the slight hold the patient has upon strength ; and that over-exertion or excitement may increase the irritations that have only been allayed, and a relapse occur. Have the physician lay down rules for visitation and relieve yourself of this responsibility if you can ; but if it does devolve upon you, do not hesitate to act upon the safe side. A patient in the excitement of a visit may not show the exhaustion, but will when the reaction comes, therefore do not allow one batch of visitors to follow another, but let an interval of at least half an hour intervene. No visitations should be permitted after 8 P.M.

With returning appetite the nurse finds it difficult to restrict a patient to prescribed diet. Here is where the

preparation of allowable dishes in an attractive manner proves very useful to a nurse.

If the patient has recovered sufficiently to read in bed, a suitable position and light must be insisted upon. Whatever the light may be, it should fall over the shoulder from behind. The upper part of the body and shoulders must be raised and then the head sufficiently to prevent straining the eyes downward. When the patient reads there must be no *strain*, either of the muscles or of the eyes. If the patient can sit up an arrangement is easily made, but a patient who becomes interested in a book does not know when to stop, and the nurse must regulate the reading hours.

A nurse should know how to prop a patient up comfortably in bed. The semi-reclining posture, unless arranged well, is very tiresome, and there is likely to be more or less strain. It is better to slip the hips up in bed while the shoulders are raised, making it the sitting posture.

When a patient first leaves the bed, arrangements should be made for it and the necessary clothing should be warmed and dried. It is better to have some garment that can be *put on* loosely, than to attempt to wrap blankets about the body, which will slip off at one place and expose the person at another. A soft blanket wrapper is the most comfortable garment for this purpose. The feet should be raised from the floor to avoid draughts. The room should be made a little warmer than usual.

It is very annoying to a patient to have the bed jarred, or to have others sit upon it. It is a common practice for visitors to get at the foot of the bed and use it for a support. To prevent this, place a stand at the foot of the bed.



A patient should be required to rinse the mouth after eating. The bed should be examined for crumbs and the wrinkles pulled out of the sheets. Before night comes, arrange to have everything likely to be needed easily at hand. Have a means for increasing the warmth of the sick-room in case of necessity.

In case of a fatal termination, the nurse should proceed with her duties quietly and unobtrusively, and not be affected by any excitement that may prevail at that time. If the critical patient asks for a clergyman, the want should be made known at once.

The nurse should learn the symptoms of approaching death. Death may occur by *asthenia*, or from the heart ceasing to beat; from *apnea*, or *asphyxia*—that is, arrest of the respiration; or by *coma*, where the brain is incapable of sustaining innervation. The signs of approaching death are, a contraction of the features, with cold extremities, clammy skin, and evidence of weak circulation. The physician should always be informed when symptoms of approaching death are seen, and the nurse receive his instructions.

It is proper that the friends should be informed that death is near. Nursing should not be relinquished, however, but the duty of the nurse should be to continue to make the patient as comfortable as possible, and continue the remedies until the last moment. Note the exact time of death and record it with the last symptoms upon the clinical record. The physician should be at once notified of the death of the patient.

After death the generation of body heat diminishes and the body cools. Much depends upon the amount of fat upon the body and the season of the year. Bodies dying from yellow fever and cholera, continue to gen-

erate heat for several hours after death. Usually the body becomes cold to the touch from eight to twelve hours after death. The coldness of the skin in collapse, or of the apparently drowned, must not be considered an indication of death.

The muscles retain their power of contractility for a period of about three hours after death, when subjected to the Faradic current. Any evidence of contractility after that should lead to an investigation.

Several hours after death, firm contraction of the muscles takes place, and the resulting stiffness is called *rigor mortis*. This is the most positive sign of death, as it indicates the death of the muscle itself. The body should be placed in the proper position and retained so until *rigor mortis* occurs.

*Putrefaction* is the change in the body after death, leading to discoloration and a distinctive odor. The signs of putrefaction may be expected soonest in a warm atmosphere. A very high or a very low temperature and immersion in fluids suspends decomposition.

The duties of a nurse in private practice do not cease until the body has been cared for, and the sick-room has been properly disinfected and put in order. She should also assist in the preparations for burial in any way she can, and it is usually expected that the nurse will remain until after the obsequies.

As soon following death as practicable, the body should be washed with carbolic solution, the lids should be closed down and held there by a compress, the lower jaw should be closed and held by a bandage, or a wedge under the jaw. The feet and knees should be tied together with a bandage. The nose, mouth, rectum and vagina should be packed with cotton to prevent

the escape of discharges. Wounds or raw surfaces should be covered with a layer of cotton and then bandaged or covered with adhesive strips. The buttocks should be enclosed in a large triangular binding (made from a sheet).

If the case was one of infectious disease the body should be enveloped in a sheet wrung out of carbolic acid solution, and this should be wet with the solution from time to time. Over all a clean sheet can be spread.

If the death occurs in a hospital ward, the body should be prepared behind screens, or in a single room, and removed to the mortuary at a time when it will attract the least attention. The death should not be mentioned to other patients, or discussed. All signs of preparation should be removed at once and completely. The patient's name and location should be written upon a card and pinned upon the covering.

## CHAPTER XXVII.

PREGNANCY ; PHYSICAL SIGNS AND SYMPTOMS ; ABORTION ; MISCARRIAGE ; ETC.

BY CAROLINE S. PEASE, M.D.

NOTE.—Since it is intended to make neither physicians nor midwives of the students of this book, but simply nurses, trained to act with intelligence under direction of the attending physician, it would seem as superfluous to burden the already crowded course of study with all the possible symptoms which might in rare instances aid in establishing a diagnosis of pregnancy, and with minute directions as to the care of the patient during that period, as to give her voluminous instructions as to how to conduct every step of every unnatural labor, or how to successfully cope with every possible emergency which could ever arise.

THE diagnosis of pregnancy rests properly with the physician, not the nurse ; so, also, does the direction of the care of each individual case during that period.

Yet a few plain general rules and directions in the recognition and care of pregnancy will make of her a more intelligent and useful nurse should she be called on, for sufficient reason, to perform a portion of the physician's duties.

Briefly, then, we may say :

*Pregnancy* is the condition of the woman who bears within her womb the product of conception—an unborn child. *Pregnancy* is also called *gestation*.

An unborn child is called a *fœtus*. During the first three months the fœtus and its membranes together are called an *ovum*; the fœtus alone, an *embryo*.

The duration of gestation is usually 280 days, or about nine calendar months, and ends with the expulsion of the fœtus.

Expulsion of the fœtus is variously called *childbirth*, *delivery*, *confinement*, *labor*, or *parturition*.

Various causes, as constitutional disease of one or both parents, falls, blows, effects of drugs, fright, etc., may cause a premature termination of pregnancy.

Should this occur before the development of the fœtus is such as to permit its existence independently of the mother, from whom it has thus far derived its supplies for tissue building, it is termed an *abortion* or *miscarriage*; occurring at a later date it is called a *premature delivery*.

Custom prescribes that, occurring within the first three months, during which time the ovum is usually expelled entire, it be called an abortion; from the third to the seventh, a miscarriage; from the seventh to the ninth, a premature delivery.

A child born after the seventh month may be safely counted on to live if properly cared for.

Numerous instances are cited of infants born before this period which have been reared.

Should symptoms of abortion or premature delivery arise, as pains in back and abdomen, more or less bloody discharge, etc., the nurse should at once place the patient in bed, keep the head low and body lightly covered, and send for the physician. Absolute rest in bed will often avert a threatened miscarriage.

With the completion of parturition, the patient en-

ters upon the *puerperal*, or *lying-in* period. This period terminates when she is able to leave her bed.

From the time of conception, then, until the woman is able to resume her usual mode of life, we recognize three distinct periods :

*Pregnancy*, or gestation, the period during which she carries the foetus ;

*Parturition*, during which she gives birth to the matured child ;

*The puerperal state*, during which she recovers her normal health.

With the first of these periods the nurse has ordinarily little or nothing to do, since she is usually called only when parturition is about to take place.

In pregnancy, as a rule, the first symptom to arrest the attention of the woman is *cessation of menstruation*. At the time when menstruation should first occur, more or less nausea and vomiting begin to occur daily. This takes place oftenest in the morning, and frequently only at this time, and is hence spoken of as *morning sickness*. This is one of the most characteristic and constant of the earlier symptoms, though in a small number of cases it is entirely absent.

In a large proportion of cases it is simply an annoying source of discomfort, but it occasionally assumes an alarming severity ; the vomiting becoming so constant as to prevent the retention of food long enough for digestion and absorption to take place, the patient literally starves. It is frequently necessary, in such cases, for the physician to bring on an abortion in order to save the life of the patient.

Nausea and vomiting usually cease about the end of the third or middle of the fourth month ; as a rule

about the time a noticeable change in the figure of the patient is seen.

Changes in the breasts occur at an early date, consisting principally in a dark discoloration of the skin around the nipples, called the *auricolæ*, in more or less enlargement of the breasts, and frequently in the secretion by them of a small amount of milk.

The duration of pregnancy is usually 280 days from date of conception, though it may fall short of that time or considerably exceed it. In a case under the personal observation of the writer, in which it was possible to fix the date of conception beyond a doubt, delivery took place on the 302d day.

We have no absolutely accurate means of determining the date on which any labor will occur, though many rules are given us by which an approximate time may be fixed. As good a rule as any is to count nine months forward from the date when menstruation last began, and add seven days: this brings us to about the time the labor will be likely to occur.

About the middle of pregnancy the patient feels for the first time independent movements of the foetus, which continue throughout the remainder of pregnancy. The time when this is first felt is called *quickenings*, or *feeling life*. Since this occurs near the middle of the period, many count forward four and a half months from this date to fix the probable date of labor. This, too, gives us a fair approximate time. Various other rules might be given, but their multiplication but tends to confuse the learner.

During the later months, as the foetus increases in size, great distension of the abdomen takes place, with more or less pressure on various organs, giving rise to discomfort, sometimes to danger.



From pressure upward of the abdominal viscera, the thoracic space is lessened, respiration is often more or less affected, and the heart's action disturbed.

Constipation from pressure on the intestinal tract is common.

Not infrequently in the later months œdema of the legs and feet occurs from interference with the circulation and the excretory function of the kidneys.

Any tendency to swelling of the lower extremities should be promptly reported to the physician, as a dangerous complication, *uræmia* may, and often does follow interference with the renal functions at this time. Neglect to observe and call attention to this condition has frequently ended in convulsions and death of mother and child.

Convulsions occurring from this cause are called *clamptic* convulsions, or *eclampsia*.

*The bowels* must be evacuated daily, but cathartics should be used with caution, as active catharsis might bring on premature delivery.

Attention to the healthful action of the skin is necessary, and daily sponge baths are of use.

Sea bathing, shower baths, turkish baths, etc., should be avoided.

*Loose clothing* should be worn throughout the entire period. Tight lacing is especially pernicious at this time.

Exercise in the open air should be taken daily, and especially should the patient not be permitted to forego this in the latter months when her increasing size and general discomfort make all effort irksome.

*The diet* should be plain and wholesome throughout; though it may be best at times to yield to the patient's desire for unwholesome articles of food. Women in

this condition frequently experience persistent and uncontrollable longing for some particular and often unattainable article for which they have not previously cared. It is better that this craving be gratified if possible than that the mental irritation consequent to the unsatisfied desire continue.

Hours of sleep should be regular and long. In a word, whatever of hygienic law is of value to woman generally, is of especial value to the woman who wishes not only to pass safely through her period of gestation and confinement, but to become the healthy mother of a healthy child.

In the later months of pregnancy, from over distension of the skin over the abdomen and thighs, much discomfort arises, and frequently numerous lines and marks appear called *striæ*, from their fancied resemblance to the stripes made by the lash.<sup>1</sup>

During pregnancy the development of the fœtus takes place within the uterus of the mother, its life is dependent on hers, receiving, as it does, the nourishment necessary to its development and growth from her. The membranes which enclose the embryo in the early months and form a part of the ovum, continue to grow and expand, completely lining the uterine cavity. By a process of its own, this membranous sac secretes the fluid called amniotic fluid, in which the fœtus lies coiled during its intra-uterine life. During gestation and delivery this bag of water serves many useful purposes. Throughout the first period it pre-

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<sup>1</sup> Gentle inunction with some bland oil, as olive or almond, will sometimes afford much relief, but massage of the abdomen is to be avoided.

vents pressure on any portion of the tender fœtus; its presence lessens the shock of accidental blows or jars which might otherwise be fatal; it helps to equally expand the uterus in all directions; it facilitates the movements of the fœtus. In labor it performs a very important function. This sac is closely adherent to the entire inner surface of the womb, becoming separated from it only in the latter part of labor.

Enclosed within a shut sac, the fœtus can of course not obtain through its lungs the supply of oxygen necessary to the sustenance of every living organism, and provision is made by which it receives its supply through its connection with the circulation of the mother. This takes place through the *placenta* or *afterbirth*, and the *funis* or *cord*.

The *placenta* is a fleshy mass, very vascular, circular in form, from six to ten inches in diameter, and from a half inch to three inches in thickness. It lies spread out between the uterine wall, to which it is closely attached on one side, and the amniotic sac by which it is closely covered, and to which it is firmly adherent, on the other. Its expulsion takes place with the empty membranous sac at the end of labor.

The *cord* consists of a membranous outer covering enclosing the large blood vessels through which the circulation between mother and child is carried on. The cord varies from 18 to 30 inches in length, is from  $\frac{1}{2}$  to  $\frac{3}{4}$  inch in diameter, and is attached to the centre of the placenta by one end, and to the umbilicus of the fœtus by the other.

Until the head is born, and the child has drawn its first breath, whatever interferes with the circulation through the cord cuts off the supply of oxygen, causes

the death of the foetus from asphyxia, and brings about the termination of gestation.

During the last fortnight of pregnancy, the patient will observe that the uterus seems settling lower in the abdomen ; that the distension seems less, and pressure upon the thoracic organs is in a measure relieved, in consequence of which respiration is less interfered with ; on the other hand, pressure upon the bladder and rectum becomes greater, and from interference with the pelvic circulation, piles (hæmorrhoids) are of frequent occurrence.

The vaginal and vulvar tissues become more swollen, and a softening takes place which renders them more readily distensible, and allows the more easy passage of the child.

More or less glairy mucus discharge is present. These are unmistakable indications of a near approach of labor, since they can only occur during the last fortnight of a full period of gestation.

The nurse should now see that everything is in readiness for parturition, which may take place at any hour.

## CHAPTER XXVIII.

### PREPARATION FOR LABOR ; NECESSITY FOR ANTI-SEPTIC CARE ; PARTURITION ; ETC.

BY CAROLINE S. PEASE, M.D.

IN preparing for labor, select the lying-in room, if possible, with the same regard to hygiene as for a fever patient (see vol. i., chapter xxvi).

See that the room is absolutely clean and free from dust, is well aired and ventilated. Remove all draperies, if possible. In private practice it will not often be possible to insure absolutely perfect surgical cleanliness of the lying-in room, as is done in hospital practice ; but this defect may be largely overcome by strict anti-septic precaution upon the part of the nurse, in permitting nothing not strictly aseptic to come in contact with the genitals of the patient during labor or the puerperal period. It is now known, beyond doubt, that one of the most frequent and serious complications of the lying-in period, viz., *puerperal fever* or *child-bed fever* is a germ disease.

As the germs are destructible, it is a preventable disease, its prevention being accomplished by absolute surgical cleanliness. Since the carriers of the germs are oftener than otherwise the hands of the physician or nurse, or the instruments and appliances brought

into contact with the birth-canal, it follows that these should be aseptic.

In the simplest and easiest labors there are always abrasions and slight tears in the mucous membrane of the vagina and vulva, which form open doorways for the entrance of germs. The surface of the uterine cavity from which the placenta has become separated during labor is also an open wound liable to infection. Every antiseptic precaution necessary should therefore be observed to prevent the possibility of germs coming in contact with these wounds. The nurse should keep her hands absolutely clean, and give especial attention to her nails. Should wear only washable clothing, freshly laundered.

Before touching the genitals of the patient during or after labor, should sterilize her hands as follows :

Clean the nails, using a nail brush.

Wash the hands and forearms with hot water and soap, scrubbing them thoroughly with a hand brush.

Rinse in clear water.

Again scrub with an antiseptic solution, or allow the hands to soak in it for three minutes.

After sterilizing, the nurse should not wipe the hands, and should hold them in the antiseptic solution for a moment each time before touching the genitals.

The following antiseptic solutions are in most common use :

I. Bi-chloride of mercury—1 to 1000.

II. Chlorinated soda (Labarraque's Solution), 1 part to 10 of water.

III. Carbolic acid, one ounce ; glycerine, one ounce, shaken together and diluted with eighteen ounces of water, making a 5 per cent. solution.

IV. Creolin—one teaspoonful to a pint of water.

The nurse should see that one or more of these are in readiness, and in sufficient quantity for frequent changes for both the hands of the doctor and her own. Throughout the labor and puerperal period she should see that these precautions are rigidly enforced.

For the patient's bed the nurse should have ready,  
A dozen freshly laundered sheets ;  
2 surgically clean rubber sheets,  $1\frac{1}{2}$  yds. square ;  
A thick pad, two feet square, filled with oakum or absorbent cotton, to absorb the discharges ;

A rubber sheet, piece of oilcloth, or an old blanket folded, to protect the carpet in front of the bed.

She should have ready also for use, as needed,

Plenty of boiled water, hot and cold ;

2 or 3 clean agate or earthen hand basins ;

A bed pan ;

A Davidson or Fountain Syringe ;

A slop jar ;

A clean vessel to receive the placenta ;

A pair of scissors ;

A yard of linen bobbin or skein of Chinese silk ;

2 dozen safety pins, large and small ;

1 pound of absorbent cotton or oakum ;

2 yds. boiled cheese-cloth for wash cloths ;

10 yds. boiled and sublimated cheese-cloth for vulvar dressings ;

A small jar of carbolized vaseline ;

$\frac{1}{2}$  pint of brandy or whiskey.

For the infant have prepared,

A woolen shawl or blanket in which to envelop it ;

A child's bath-tub and bath-thermometer ;

An ounce of olive oil ;



A piece of Castile soap ;  
A package of salicylated cotton ;  
The child's clothing ;  
Plenty of safety pins.

The beginning of labor is ushered in by pains in the back and loins, recurring at regular intervals, and by a considerable discharge of a glairy mucus tinged with blood, called the "*show*."

When this occurs, notify the physician, and promptly prepare for labor, since it is impossible to foretell in any instance whether the labor will be a rapid or a slow one. The first stage is the longest, and usually lasts several hours, though the entire labor is sometimes completed within an hour.

Brush the patient's hair and braid it tightly ; put on her night-dress, underdrawers and stockings ; over these may be worn a wrapper and bed-room slippers until she goes to bed.

Under her night-dress, pin a folded sheet about her waist to fall like a skirt, with the opening in front. The left-hand corner of this may be passed backward between the thighs and pinned, as a protection in case of sudden discharges from premature rupture of the membranes. Allow the patient the liberty of the room, and instruct her not to bear down during the pains of this stage.

Prepare her bed as follows : over the mattress spread a rubber sheet ; over this a clean sheet firmly pinned at the ends ; over this a folded draw sheet. These are to remain on after labor is completed.

Then prepare a second rubber sheet and a second draw sheet ; these will be removed, with the folded

sheet which has been pinned about the waist, when the labor is over, leaving the bed clean without disturbing the patient to change the sheets.

Instruct the patient to frequently evacuate the bladder.

*In every case give a rectal enema* of warm soap-suds during this stage. This not only removes an obstruction to the passage of the fœtus through the pelvis, but spares the mother the mortification of an involuntary evacuation later when the fœtal head presses low against the rectum.

Have ready for the doctor's examination :

Two agate or earthen hand basins ;

Two hand brushes ;

A clean piece of good soap ;

Plenty of hot and cold water ;

An antiseptic solution.

Before his examination, cleanse the external genitals thoroughly with soap and water, again with clean water, and bathe with the antiseptic solution.

A normal labor is divided into three stages :

(1) The stage of dilatation ;

(2) The stage of expulsion ;

(3) The expulsion of the *secundines* (after-birth and membranes).

During the first stage the neck of the uterus which had remained closed previously, dilates sufficiently to permit the passage of the fœtus.

This dilatation is accomplished as follows: The muscular tissue of the uterus contracting on all sides forces the bag of water downward in the direction of least resistance. With each contraction of the uterus it is forced like an entering wedge farther and farther

into the narrow cervical canal until dilatation is complete. This ends the first stage.

The patient should now be placed in bed ; the night-dress should be neatly folded under her arms and securely pinned ; and the folded sheet adjusted like a skirt under her thighs.

The absorbent pad may now be placed under her hips, inside this sheet, as rupture of the membranes will be likely now to occur. With rupture of the membranes and the escape of the water, descent of the head begins, and the patient enters upon the second stage—that of expulsion.

The character of the patient's outcry usually indicates when this begins. From having been of a fretful and impatient character, it is now suppressed in character, as if the patient were expending her strength in efforts to help in the expulsion. After a varying period, the child's head appears at the vulvar orifice, which gradually stretches to permit its passage. This is usually followed, after a brief interval of rest, by a single long-continued pain which forces the body of the foetus out through the vulva, and the second stage of labor is completed.

As the child's head escapes from the vulva, the physician, or in his absence the nurse, quickly passes the finger around the child's neck within the vulvar orifice to ascertain if the cord be around the child's neck. This is a doubly dangerous complication since it might cause the child's death before it had inhaled a breath, from pressure upon the cord, or might strangle the child from pressure on its throat after it had breathed.

The physician will pass the finger into the child's

mouth and quickly remove any discharges which may have entered during birth, and which might obstruct respiration, and will, after the child has given its first cry, lay it to one side and tie the cord.

*Remember always that this is never done until respiration is established.*

Taking hold of the cord firmly near the navel with the thumb and finger of the right hand, with the left he "strips" the cord for three or four inches downward, to remove as much as possible a gelatinous substance surrounding the vessels, and ties it firmly two inches from the umbilicus with a piece of the linen bobbin provided by the nurse. He ties again an inch or two further down the cord, and with the scissors cuts between. The nurse should have the blanket warmed in which to wrap the child now, should lay it away in a warm and safe place, not upon the mother's bed, and be ready further to assist the physician if needed.

After a short period of rest, during which the physician watches the patient carefully with the hand over the uterus, another pain occurs, and the placenta and membranes are expelled.

If the interval is too long, or the patient in danger of hæmorrhage, the physician is often obliged to resort to artificial means of expulsion.

This should not be attempted by the nurse without she has had previous practical instruction, as serious accidents might follow bungling attempts.

Have the vessel ready in which to receive the placenta, which must be put aside for the doctor's examination later.

Be ready to assist the physician by "watching" the

uterus, which is done by keeping the hand firmly over the lower part of the abdomen, through whose walls it is felt like a firm hard ball. Should it relax so as not to be felt, briskly rubbing the abdomen will usually excite contraction.

Dangerous hæmorrhage might follow its relaxation. When the patient has rested a few moments, draw down the sheet which has been pinned about the waist, together with the absorbent pad, the draw sheet and rubber sheet, leaving under her the clean draw sheet, clean sheet, and rubber sheet. At the same time slip under her hips a clean folded sheet.

Sterilize the hands, and sponge off the vulva and thighs with the antiseptic solution, using for a wash cloth a piece of boiled cheese-cloth. Tear the unbleached muslin lengthwise in three strips. Slip one under the patient, letting it extend from the pubis to the thorax. Begin at the bottom and pin tightly two inches apart, not lapping the ends, but pinning like a seam in the median line in front. This makes the most comfortable adjustment possible. A binder pinned to fit badly is not only uncomfortable but injurious; a properly adjusted one is quite the reverse. It should be readjusted two or three times daily during the lying-in.

A vulvar dressing should now be applied, pinned firmly to the binder, and changed as often as requisite. It should be prepared during the early stages of labor as follows: From the sublimated cheese-cloth<sup>1</sup> tear pieces  $\frac{1}{2}$  yd. square. Fold these diagonally four inches

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<sup>1</sup> Which had been prepared before labor by boiling in strong soap suds, again in clear water, then soaked for an hour in 1 to 1000 bichloride solution and dried.

wide, and enclose a thick pad of oakum or absorbent cotton. Apply closely to the vulva, pinning tightly to the binder.

Whenever a change in dressing is made, which must be several times daily, and always often enough to prevent fetor, bathe the parts with the antiseptic, having sterilized the hands as directed.

Burn all soiled dressings when removed. With the expulsion of the placenta, the third stage of labor is completed, and the patient enters on the puerperal state.

After the soiled bedding has been removed, and the patient made comfortable in bed, she may be given some light nourishment, as a glass of milk, or a cup of tea and a cracker or two, after which she will wish to lie quietly and rest. This she should be allowed to do, the nurse examining from time to time to see that hæmorrhage is not taking place.

Exclude visitors from the room. After the mother has rested, and the child is properly washed and dressed, it should be put to the breast, and at intervals of two hours thereafter. Aside from the necessity to the child of obtaining the colostrum, the nursing helps to excite in the mother the needed uterine contractions.

In *multiparæ*,<sup>1</sup> *after-pains* usually occur at intervals for a day or two after labor. These are sometimes almost as severe as the labor pains have been. So far from indicating that anything is wrong, they simply announce that vigorous contraction of the long over-stretched muscular tissue is taking place. These pains serve also to empty the uterus of the discharges which from time to time accumulate there.

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<sup>1</sup> Women who have previously borne children.

If the breasts are painful or engorged, it may be well to rub them lightly with oil, remembering to stroke them always toward the nipple. Milk as a rule appears the third day, though it may be delayed. At this time the patient will seem more nervous and restless than previously.

If the child is unable to empty the breasts completely, nursing alternately from them, they must be emptied by means of a breast pump, which can be obtained at the druggist's.

Sunken or undeveloped nipples may be improved by gentle drawing out several times daily, using at the time a little bland oil or cold cream, to prevent injury to the sensitive skin.

Should a fissure occur, nipple shields must be used at the time of nursing. The nipple should be sponged off after each nursing with a five per cent. boric acid solution. Sponging the nipples several times daily with a little tincture of benzoin tends to harden the skin and render them less sensitive. They must, of course, be sponged off before nursing.

If the child is not to be nursed, and it is necessary to stop the secretion of milk, it may be done as follows: Limit the fluid taken to the least possible amount. Bandage the breasts tightly, so that the pressure will be as evenly distributed as possible. Rub the breasts from time to time gently toward the nipple. If they are likely to become too greatly distended, the milk may be partly drawn off by the breast pump.

During the puerperal period, remember that the patient is virtually a complicated surgical case, and watch her with care.

If, four or five hours after labor, the patient has not



urinated, the catheter should be used, and at intervals of six to eight hours thereafter. There is often a temporary paralysis of the bladder after labor.

Do not allow the patient to raise her head from the pillow during the first twenty-four hours.

The *diet* should be light during the first week, but after that, if there be no contra-indication, she may return to her usual diet.

On the third day a laxative or a rectal enema should be given. There is a popular prejudice in favor of castor oil at this time, which is, however, founded upon nothing stronger than custom.

The name applied to all discharges from the vulva during the lying-in is *lochia*. For the first week—though the time varies greatly in different cases—the lochia contains a daily diminishing amount of blood. After that time it is a creamy, yellow-white liquid, continuing in more or less quantity for about a month.

The lochial discharges have a peculiar odor—which is as characteristically their own as that of the urine or the perspiration. The nurse should watch carefully for the first appearance of *fetor* in the discharges, and should notify the doctor at once should any be noticed. As to the necessity for douches, physicians differ radically in opinion, and the nurse must be guided by the judgment of the physician she serves. The writer is a devout apostle of the douche, properly used—but in this every physician will insist on “being a law unto himself.”

At the end of a week the patient may be permitted the bed-rest daily for an hour or two, and at the end of a fortnight, if all is well, to leave her bed—though many patients require to be kept there much longer.

Only the course of a simple, normal pregnancy, labor, and lying-in has been outlined in these lessons. Individual cases will differ; emergencies will arise requiring intelligence and strength of nerve to meet. If the nurse masters the care of a simple, normal case, to it will be added in her daily practice the experience which will enable her to meet each occasion as it arises.<sup>1</sup>

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<sup>1</sup> It has been suggested that some instruction as to the management and care of labor cases in *the insane* be incorporated in this chapter. It has been the fortune of the writer during six years of practice in hospitals for the insane, to attend in labor a number of insane women. She has yet to see one case in which physician or nurse need depart from the treatment accorded to sane women, or to find one insane woman less tractable, docile, and obedient to every direction of physician or nurse than sane women are.

## CHAPTER XXIX.

### CARE OF THE INFANT.

BY CAROLINE S. PEASE, M.D.

AFTER the labor is ended, and the mother made comfortable and left to rest, the nurse may attend to the washing and dressing of the infant.

She should place a warmed bath towel on her lap, in which she should envelop the infant, exposing only so much of the body at a time as is absolutely necessary, and carefully guarding against chill. A feeble child should not be bathed the first day, but should instead be gently rubbed with oil and wrapped warmly in flannel.

The face and eyes should be cleansed, using a five per cent. solution of boracic acid for bathing the eyes. Wash out the mouth with a bit of absorbent cotton wound about the finger and dipped in the boracic acid solution.

If the infant be strong, bathe as follows :

Rub the skin with oil wherever a cheesy deposit is found, especially in the folds. Wash this off with the castile soap and warm water, rubbing as little as possible. Cleanse carefully around the stump of the cord with the antiseptic solution. Wrap the stump in a bit of salicylated cotton and lay to the left. Apply a flan-

nel band reaching from the armpits to the hips. Next apply the child's diaper, well warmed.

A shirt or vest of soft flannel with long sleeves should come next, with a flannel skirt or pinning blanket long enough to fold upward over the child's feet. Over these a slip or night-dress may be worn, and the child should be enveloped finally in a light flannel blanket, a corner of which should be turned over the head.

When the mother has rested sufficiently, the child may be given the breast, which it will usually take without trouble, if attempts have not yet been made to feed it artificially. Milk does not appear as a rule in the breasts until the third day, but the child obtains instead a thick nutritious substance called *colostrum*, which acts as a gentle laxative and affords all the nourishment needed. The very common habit of feeding the child butter and sugar to move its bowels is objectionable and unnecessary, as is also that of giving it bread and sugar tied in a rag to suck.

Should it become necessary to feed the child, before the mother's milk comes, or should the mother for any cause be unable to nurse the child, the rules for infant feeding should be observed.

The child should be bathed daily, preferably in the morning, and always midway between two feedings. The duration of the child's bath should be as short as possible; and until the stump of the cord has dropped off, it is better that sponge baths be given. If given in its tub, the cord must be wiped carefully, and a fresh dressing of salicylated cotton applied each time.

Watch the stump carefully from day to day, and if fetor develops, or any irritation about its base is seen,

call the attention of the physician to it. The stump dries away and separates of itself if properly cared for, from the fifth to the eighth day, leaving a clean healed umbilicus. It is well to apply a small compress of the salicylated cotton over the umbilicus for a few days after separation of the cord, as children are especially liable to hernia at this point through straining of the abdominal walls in crying.

The child must always wear soft flannel next its skin.

The bowels should be moved two or three times daily, and the urine should be frequently voided. The napkin must be changed as often as wet, the skin carefully sponged and dried, and, if any irritation be observed, a little finely powdered talc, oxide of zinc, or other bland powder dusted in the folds.

Note carefully the condition of the child's eyes, and should the slightest irritation or discharge be seen, notify the physician without delay.

The infant should sleep from eighteen to twenty hours out of each twenty-four during the first three months. It must have regular hours for nursing or feeding. One can scarcely imagine a more reprehensible habit than that of putting the infant to the breast whenever it cries or frets. Too often its discomfort and fretfulness are the result of this mistaken kindness.

The child should sleep in a crib by itself, and should not be taken up and rocked whenever it is awake or fretful. Remember that it rests with the nurse and mother to train it to comfortable, contented habits, or to make of it a fretful small tyrant constantly in arms of the nurse or mother.

The preparation and regulation of the diet of infancy, except during the lying-in period, during which the child is in care of the obstetric nurse, rest with the "child's nurse," and form no part of the regular work of the sick nurse. The following simple directions, however, copied from Jewett's admirable little book on child-bed nursing, for the preparation of food during the first six months, will be useful.

#### MILK MIXTURE.

Cows' milk—mixed dairy milk.....	10 ounces.
Water, previously boiled.....	5 "
Milk sugar (re-crystallized and perfectly pure,)	6¾ drams.
Common salt.....	8 grains.
Lime-water—just before feeding.....	1 ounce.
Mix.	

During the first two or three weeks the mixture should usually be reduced by adding three to five ounces more water than the formula prescribes.

Sterilize as follows: Fill ten clean bottles to the shoulders, each holding enough for one feeding. Plug the mouths with rubber stoppers.

Stand the bottles in a kettle and cover to the shoulders with cold water. Boil twenty minutes.

Or better, steam the bottles for thirty minutes in a steam sterilizing apparatus to be obtained at the drug stores.

Place the stoppers loosely in the necks of the bottles for the first ten minutes of boiling, then push them firmly in.

Keep on ice in hot weather.

*Feeding.*—Warm the bottle to 100° F. before feeding, then remove the stopper, add half a teaspoonful of

lime-water for each ounce of the prepared food, and slip a clean rubber nipple over the neck of the bottle.

Let the child nurse directly from the sterilizing bottle. Cleanse the nipple inside and out after each feeding, and the bottle in like manner.

Boil the nipples for ten minutes before using, and the bottles before refilling.

#### AMOUNT AND FREQUENCY.—RULES FOR GENERAL GUIDANCE.

AGE.	Intervals of Feeding.	Amount at each Feeding.	Number of daily Feedings.	Average daily Amount.
First day . . .	2 hours . . . .	1 drachm . .	10	10 drachms
Second day . .	2 hours . . . .	$\frac{1}{2}$ ounce . . .	10	5 ounces
Third day . .	2 hours . . . .	1 ounce . . . .	10	10 ounces
Second week . .	2 hours . . . .	$1\frac{1}{4}$ ounces . .	10	$12\frac{1}{2}$ ounces
Six weeks . .	$2\frac{1}{2}$ hours . . . .	$2\frac{1}{4}$ ounces . .	8	18 ounces
Three mos. . .	3 hours . . . .	4 ounces . . .	6	24 ounces
Six months . .	3 hours . . . .	6 ounces . . .	6	36 ounces

It is now believed by many that sterilization at a low temperature, or Pasteurization as it is commonly termed, is equally efficient, without objectionable changes occurring which are unavoidable where the milk is subjected to boiling.

The necessary apparatus for sterilizing at low temperature can be readily improvised, and is to be found in every house. All that is needed is a tin pail with a tightly fitting cover, in which stand the bottles. Fill the clean bottles with milk, stopper them with a little absorbent cotton, and place them upright in the pail. If a rack to hold the bottles be obtainable, it is more convenient, but not indispensable. Fill the pail with



*boiling water* as high as the milk in the bottles, cover tightly and let it stand until cool, when the bottles should be placed in the refrigerator.

It sometimes occurs that every form of milk temporarily disagrees with the child, and soon causes vomiting or colic. In such cases it may be necessary to aid the feeble digestion by peptonizing the milk for a short time. This is easily done as follows: For each ounce of the sterilized mixture, add  $\frac{1}{8}$  grain extract of pancreas (Fairchild's) and  $\frac{4}{8}$  gr. sodium bicarbonate, shaking until dissolved.<sup>1</sup> Stand the bottles in water at a temperature of 105° F., and let them remain ten minutes.

The *colic* of infancy, which always indicates fermentation of food and consequent accumulation of gas, is usually relieved by the application of heat, as a heated flannel, over the abdomen; should this fail, a drop or two of essence of peppermint in a teaspoonful of sweetened water will afford relief.

For the more serious problems arising in the care of the infant during the time it may be in the care of the obstetric nurse, she should in each individual case consult the attending physician and be guided by his counsel.

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<sup>1</sup> Powders of the required size should be put up at the drug-gist's, and kept ready for use.

## CHAPTER XXX.

### GYNÆCOLOGICAL NURSING.

BY CAROLINE S. PEASE, M.D.

*Gynæcology* is the science that treats of diseases peculiar to women. The nurse should have a good general idea of the requirements in this class of cases, while it is to be remembered that the details of care in each case will be prescribed by the physician in charge. In the matter of common needs, as of douches, catheterization, enemas, etc., she should be well prepared by the requisite knowledge of details.<sup>1</sup>

For the general care of gynæcological cases the same general rules are applicable as in diseases of other organs, and reiteration of details would be unnecessary.

In their special care, one of the first essentials is for the nurse to understand what assistance she is expected to give the physician in an examination of the pelvic organs and what preparation must be made for it.

If the nurse is aware beforehand that an examination is to be made, she should give a rectal enema, as frequently it becomes necessary to examine through

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<sup>1</sup> The nurse who is unable to catheterize her patient without subjecting her to torture in the process, or who, when directed to give a hot douche, executes the order with a pint of lukewarm water, a part of which she allows to soak into the bed, is not likely either to gain the respect and confidence of her patient, or to be called by the physician to care for a second case.

the rectum to determine regarding some point not to be ascertained through a vaginal examination alone.

In preparing for a first examination of the patient, a vaginal douche should not be given, as the amount and nature of the vaginal discharges, condition of vaginal walls, etc., help largely in informing the physician as to the condition of the case. In preparing for subsequent examination, a douche should be given.

In every case see that the genitals and underclothing of the patient are scrupulously clean. Have ready for the examination, so that there may be no annoying delay, a hand-basin, hot and cold water, soap, towels, and vaseline, and, if possible, a pint of antiseptic solution.

If the examination be a digital one only, and the patient in bed, it will be necessary only to move her as near the front of the bed as possible, and turn back out of the physician's way all bed covering except the upper sheet, under cover of which the examination will be made. A chair will be placed at the bedside for the physician.

Should the examination be made by speculum, the patient should be placed in the proper position by the nurse, always taking care that the patient is protected by proper covering, from unnecessary exposure.

The principal positions in which the nurse will be required to pose the patient for examination or treatment, are four, all others being modifications of some one of these.

They are the *dorsal*, the *left lateral* or *Sims' position*, the *knee-chest*, and the *upright*.

In the *dorsal* position, the patient lies flat on her back, with her knees drawn up, the feet being usually braced against some support. This is the position required for

examination with the cylindrical or bi-valve speculum, and is that adopted in many surgical operations. It is the most frequently needed of all the different positions. The patient should be placed on the table or couch, and a sheet thrown lengthwise across her, reaching from the waist down over her feet. The nurse should throw the sheet across her with the left hand, and with the right hand should raise the patient's clothing together with the sheet to a point a little above the pubis, letting the sheet fall over the inner side of the limbs on either side, thus covering them and the clothing entirely from view.

By this arrangement of the sheet the vulva only is exposed to view, while neither clothing nor sheet impedes the examiner's movements and the limbs are completely covered in a bifurcated drapery, and the necessity for using a separate sheet for each limb obviated. The nurse should be ready to hand to the physician whatever instruments and appliances he may need to use, and to take from him each one as he finishes using it.

Before handing the speculum, she may dip it for a moment in hot water, and rub over it a little vaseline.

At the end of the examination it will be the work of the nurse to wash and dry the instruments used, after having prepared the water and towels for the doctor's hands and having made her patient comfortable. She will wash the instruments thoroughly in hot water with plenty of soap, rinse thoroughly in boiling water, or let them lie a few minutes in a carbolic solution.<sup>1</sup>

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<sup>1</sup> The nurse should remember never to allow the bi-chloride solution to touch steel instruments.

In the *lateral*, or Sims' position, the patient lies upon the left side and chest, with the left arm extended behind her, the buttocks well out over the left side of the table, and her head and right arm well to the right side of the table, the right shoulder thrown forward as much as possible, the knees being drawn up, and the right one drawn up above the left.<sup>1</sup>

The nurse is usually called on to hold the Sims' speculum in position, as its use, while affording the most perfect view attainable of cervix and vagina, necessitates the services of an assistant.<sup>2</sup> While holding this speculum, the nurse should stand at the left side of the patient, with the left hand separate the labia, and with the right hold the speculum firmly in the exact position directed by the physician.

For the *knee-chest* position the patient lies flat on her chest, with the hips elevated, and the weight of the body resting largely upon the knees. In this posture also, the Sims' speculum is used. This is the position chosen also for replacing a retroverted or retroflexed uterus, as we may then avail ourselves of the aid of gravity in removing the weight of the abdominal contents which in other postures rest more or less heavily on the displaced organ.

If necessary to examine the patient in an upright position, she stands with the right foot resting on a low stool, while the physician kneels on one knee on the floor in front of her, and the clothing falls over his arm during the examination. Some physicians make ex-

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<sup>1</sup> In this position the Sims' speculum, a speculum with a single blade, devised by the late Dr. Marion Sims, is always used.

<sup>2</sup> A self-retaining modification of this speculum is now in more or less common use.

aminations and introduce pessaries in this position, and a modification of it is sometimes used in examining a pregnant woman.

Examinations are better made with the patient upon a table devised for the purpose, of which there are many different forms in use, or even upon a couch such as may be found in most houses, than on a bed.

Instruments with the appearance of which the nurse should make herself familiar, in order that there may be no awkward delay in handing them when called for, are catheters of all kinds—dressing forceps—applicators—cotton-holders—sounds—probes—curettes—tenaculæ—dilators—retractors—depressors—*écraseur*—various styles of needles—needle-holders—artery forceps, etc. She should know also the different forms of uterine support, as the Hodge pessary and its variations—an entirely internal appliance; and the McIntosh supporter, an internal support kept in position by an external appliance, in cases where the vulvar orifice through laceration, has become too large to retain a wholly internal support.

She should be able to make as needed the various tampons preferred by different physicians under different conditions. The *tampon* in most common use is made by cutting a sheet of absorbent cotton in strips four inches wide, rolling an end loosely until it is about an inch and a half in diameter, cutting it off, and tying tightly with a strong twine around the middle, leaving five or six inches of the string attached, for convenience in removal. Tampons of this kind are used both for support and for keeping medicinal applications in contact with the parts.

For applications only, the *butterfly* tampon is often

used, consisting of a piece of absorbent cotton four inches square, tied firmly around the middle and the ends spread out.

A *kite-tail* tampon is made up of several single tampons tied a few inches apart upon one string for greater facility in removing. These are often used packed rapidly and tightly one after another in cases of uterine hæmorrhage. Strips of cotton cloth are often used similarly as tampons in emergencies when cotton is not at hand and delay would be dangerous.

In gynæcological work the nurse is constantly called upon to catheterize the patient. The utmost care should be used to keep the catheters aseptic, or a painful and dangerous cystitis (inflammation of the bladder) may be set up.

*Lavage*, or a washing out of the bladder, is frequently necessary in inflammatory conditions, but should never be resorted to except by direction of the physician. If a double current catheter be obtainable, it is only necessary to introduce it, and when the bladder shall have been emptied, introduce the fluid intended for the washing through the rubber tube of a fountain syringe slipped over the end of the catheter, the water flowing out through the return channel as fast as introduced. Should she have, however, but a single catheter, the urine may be drawn off, after which the tube of the syringe may be attached to the catheter and a half pint of the fluid allowed to slowly run in. The syringe is then detached, and the water allowed to escape through the catheter. As soon as the patient complains of any considerable pain during the introduction of the fluid with the single catheter, it is well to allow no further distension of the bladder.



In all gynæcological work it is essential that the strictest cleanliness be observed ; not simple cleanliness, but *surgical* cleanliness.

One of the hardest lessons sometimes for the nurse to learn is that, where she has been taught that in certain work she must use certain implements and appliances, in actual practice, outside of hospitals, her ingenuity must frequently be called into play to devise substitutes for the unattainable necessities. In no one way, perhaps, is a nurse's intelligence and value more clearly demonstrated than by her ability to mould the means at her hand to her use.

The nurse who, if taught that a rubber sheet must be provided to protect the carpet in front of the bed, can not make the old quilt or worn out breadth of carpet instead do efficient service, is not likely to make a valuable helper to the physician.<sup>1</sup>

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<sup>1</sup>It is anticipated that this recitation will be supplemented by clinical work, and, in the practice class, in the preparation of articles used in gynæcology, in familiarity with the appearance and names of instruments, devices, etc.



## APPENDIX.

### MEASURES, WEIGHTS, AND SYMBOLS.

#### *Apothecaries' Weight.*

20 grains	1 scruple	℥	
60 grains	3 scruples	1 drachm	3
480 grains	24 scruples	8 drachms	1 ounce $\frac{3}{4}$

#### *Apothecaries' Measure.*

60 minims	1 fluid-drachm	f 3
8 fluid-drachms	1 fluid-ounce	f $\frac{3}{4}$
16 fluid-ounces	1 pint	O
2 pints	1 quart	qt.
4 quarts	1 gallon	gal.

#### *Approximate Measures.*

1 teaspoonful	1 fluid-drachm	f 3
2 tablespoonfuls	1 fluid-ounce	f $\frac{3}{4}$
1 wineglassful	1 $\frac{1}{2}$ ounces	
1 teacupful	4 fluid-ounces	

#### *Thermometer Scales.*

The *Fahrenheit* scale records the freezing point at 32 and the boiling point at 212.

The *Centigrade* scale records the freezing point at 0 and the boiling point at 100.

The *Réaumur* scale records freezing at 0 and boiling at 80.

The rule for converting Fahrenheit degrees into Centigrade, is to subtract 32, multiply by 5, and divide by 9.

To convert Centigrade into Fahrenheit degrees, multiply by 9, divide by 5, and add 32.

The following table gives the relative values of Fahrenheit and Centigrade scales :

F.	C.	F.	C.	F.	C.	F.	C.
32	0	50	10	68	20	86	30
34	1.1	52	11.1	70	21.1	88	31.1
36	2.2	54	12.2	72	22.2	90	32.2
38	3.3	56	13.3	74	23.3	92	33.3
40	4.4	58	14.4	76	24.4	94	34.4
42	5.6	60	15.6	78	25.6	96	35.6
44	6.7	62	16.7	80	26.7	98	36.7
46	7.8	64	17.8	82	27.8	100	37.8
48	8.9	66	18.9	84	28.9	102	38.9
						104	40
						106	41.1
						108	42.2

### *Metric System.*

The metric system is a decimal system of weights and measures used in France and Germany, and quite generally in science. The standard of measure is the *metre*. The standard of weight is the *gram*. The standard of volume is the *litre*. The divisions are all by decimals, 10s, 100s, etc.

### *Measure.*

1000	metres	1 kilometre
100	metres	1 hectometre
10	metres	1 decametre
.1	metre	1 decimetre
.01	metre	1 centimetre
.001	metre	1 millimetre

### *Volume.*

1000	litres	1 kilolitre
100	litres	1 hectolitre
10	litres	1 decalitre
.1	litre	1 decilitre
.01	litre	1 centilitre
.001	litre	1 millilitre

*Weight.*

1000	grams	1 kilogram
100	grams	1 hectogram
10	grams	1 decagram
.1	gram	1 decigram
.01	gram	1 centigram
.001	gram	1 milligram

1 metre is equal to 39.37 inches.

1 litre is equal to 1 quart and  $\frac{1}{2}$  gill.

1 gram is equal to 15.43 grains.

1 minim is equal to .061 cubic centimetres.

The symbol for a centimetre is cm., and for a cubic centimetre ccm. A cubic centimetre is equivalent to a gram (fluid).

To convert *grains* into grams, or *minims* into ccm., divide by 15; and to convert *grams* into grains, or *cubic centimetres* into minims, multiply by 15.

To convert *grams* into drachms, or *cubic centimetres* into fluid drachms, divide by 4; or to convert *drachms* into grams, multiply by 4.

To convert *ounces* into grams, multiply by 30; or grams into ounces, divide by 30.

## SYMBOLS AND ABBREVIATIONS.

- AA, *ana*, of each.  
 Add., *adde*, add.  
 Ad lib., *ad libitum*, without limit.  
 Alt. hor., *alternis horis*, every other hour.  
 Alt. noct., *alterna nocte*, every other night.  
 Alt. dieb., *alternus diebus*, every other day.  
 A. C., *ante cibum*, before food.  
 App., *applicatur*, apply.  
 Aq. dest., *aqua destillata*, distilled water.  
 Aq. pur., *aqua pura*, pure water.  
 B. i. d., *bis in dies*, twice a day.  
 C., *congius*, a gallon.  
 Cap., *capiat*, let him or her take.  
 C.cm., *cubic centimetre*.  
 Cir., *circa*, about.  
 Cm., *centimetre*, .394 inches.  
 Coch. amp., *cochlear amplum*, a table-spoonful.  
 Coch. parv., *cochlear parvum*, a tea-spoonful.  
 Collyr., *collyrium*, eyewash.  
 Comp., *compositus*, compound.  
 Conf., *confectio*, a confection.  
 Cort., *cortex*, the bark.  
 Decoct., *decoctum*, decoction.  
 Decub., *decubitus*, lying down.  
 Det., *detur*, let it be given.  
 Dil., *dilutus*, dilute.  
 Div. in p. aeq., *dividatur in partes aequales*, divide into equal parts.  
 Drm., *drachma*,  $\frac{1}{3}$ , a drachm.  
 Elect., *electuarium*, electuary.  
 Emp., *emplastrum*, a plaster.  
 Et al., *et alibi*, and elsewhere.  
 Et seq., *et sequentia*, and the following.  
 Fin., *ad finem*, at the end.  
 Fl. or f., *fluidus*, fluid.  
 Ft., *fiat*, let there be made.  
 Garg., *gargarisma*, a gargle.  
 Gr., *granum* or *grana*, grain or grains.  
 Gtt., *gutta* or *guttae*, a drop or drops.  
 Guttat., *guttatim*, by drops.  
 H. n., *hac nocte*, to-night.  
 H. s., *horae somni*, at bedtime.  
 Id., *idem*, the same.  
 Inf., *infusum*, an infusion.  
 Inject., *infectio*, an injection.  
 In pr., *in principio*, in the beginning.  
 Lb., *libra*, a pound.  
 Linim., *linimentum*, liniment.  
 Liq., *liquor*.  
 Lot., *lotio*, a lotion.  
 M., *misce*, mix.  
 M., *mane*, in the morning.  
 M. ft., *mistura fiat*, let a mixture be made.  
 Mist., *mistura*, a mixture.  
 MM., *mininum*, a minim.  
 N., *nocte*, at night.  
 N. inque., *nocte manequ*, night and morning.  
 No., *numero*, in number.  
 Nos., *numeros*, numbers.  
 O., *octarius*, a pint.  
 Ol., *oleum*, oil.  
 O. m., *omne mane*, every morning.  
 O. n., *omne nocte*, every night.  
 Ov., *ovum*, an egg.  
 Oz., *uncia*,  $\frac{1}{3}$ , an ounce.  
 P. c., *post cibum*, after food, meals.  
 Pil., *pilula*, a pill.  
 P. m., *primo mane*, the first thing in the morning.  
 P. r. n., *pro re nata*, as circumstances require.  
 Pulv., *pulvis*, a powder.  
 Q. h., *quaque hora*, every hour.  
 Q. s., *quantum sufficit*, as much as needed.  
 Quot., *quotidie*, every day.  
 R., *recipe*, take.  
 Rad., *radix*, root.  
 S. or Sig., *signa*, write.  
 Scr., *scrupulum*,  $\frac{1}{2}$ , a scruple.  
 Sem., *semen*, seed.  
 S. o. s., *si opus sit*, if necessary.  
 Ss., *semissis*, a half.  
 Stat., *statim*, immediately.  
 Sum, *sumendum*, to be taken.  
 S. v. g., *spiritus vini gallici*, brandy.  
 S. v. r., *spiritus vini rect.*, alcohol.  
 Syr., *syrupus*, syrup.  
 T. i. d., *ter in die*, three times a day.  
 Tr., *tinctura*, tincture.  
 Troch., *trochisi*, troches, lozenges.  
 T. u., *tussi urgente*, when the cough is troublesome.  
 U., *utendum*, to be used.  
 Ung., *unguentum*, ointment.  
 Vesp., *vespers*, in the evening.  
 Vic., *vices*, twins.

TABLE OF DRUGS, DOSES, ACTION,  
AND USES.

NAMES AND FORMS.	DOSES.	USES.
ACETANILID (powd.)	gr. 2-15	<i>Antipyretic.</i> In fevers, headaches, etc.
ACID, BENZOIC	gr. 5-15	<i>Antiseptic.</i> In cystitis. Prevents decomposition.
ACID, BORIC Ointment	gr. 5-15 Externally	<i>Antiseptic.</i> Externally. A mild non-disinfectant.
ACID, CARBOLIC (Phenol)	gr. $\frac{1}{4}$ -1	<i>Corrosive. Antiseptic.</i> In solution 1 to 20, saturated, one of the most reliable disinfectants.
ACID, CITRIC As syrup of	gr. 5-30	A cooling drink in scurvy.
ACID, GALLIC	gr. 5-20	<i>Astringent.</i> To check hæmorrhage.
ACID, HYDROCHLORIC Dilute 10%	m. 5-20	<i>Tonic.</i> In fevers, indigestion, heartburn, etc., given much diluted.
ACID, HYDROCYANIC Dilute 2% (Prussic Acid)	m. 1-3	<i>Sedative.</i> In cough or vomiting from nervous irritability.
ACID, NITRIC Dilute 10%	m. 5-30	<i>Tonic.</i> Diluted as a drink in fevers. Stimulates liver.
ACID, PHOSPHORIC Dilute 10%	m. 5-30	<i>Tonic.</i> In nervous debility.
ACID, SALICYLIC	gr. 5-60	<i>Antiseptic.</i> Locally and internally.
ACID, SULPHURIC Dilute 10% Aromatic, 20%	m. 10-30 m. 5-15	<i>Astringent. Tonic.</i> Dissolves quinia. Diluted as a drink in typhoid fever and other fevers.
ACID, TANNIC	gr. 1-20	<i>Astringent.</i> Locally to contract tissue. Internally in diarrhœa, hæmoptysis, etc. As a gargle.
ACONITE (root and leaves)		<i>Sedative. Diaphoretic. Diuretic.</i>
Solid extract	gr. $\frac{1}{10}$ - $\frac{1}{4}$	To reduce external tension.
Fluid extract	m. $\frac{1}{2}$ -2	Tonsillitis and in fever.
Tincture of root	m. $\frac{1}{2}$ -5	
Plaster	Externally	
Aconitine	gr. $\frac{1}{200}$	
(Active principle)		
ALCOHOL	3 i-3 ii	<i>Stimulant.</i> In large doses <i>sedative.</i> A powerful heart stimulant.
In spirituous liquors		
Spr. Frumenti (whiskey)		
Spr. Vini Gallici (brandy)		
ALUM	gr. 5-30	<i>Astringent. Emetic.</i> Gargle. Checks hæmorrhage.



NAMES AND FORMS.	DOSES.	USES.
<b>AMMONIA</b>		
Aqua, 10%	m. 10-30	<i>Stimulant.</i>
Aqua fortior, 28%	m. 3-6	Volatile. Used for blistering.
Spirits, Aromatic	3 ½-2	
Bromide of	gr. 5-30	
Carbonate of	gr. 2-15	
Acetate, solution	3 2-8	<i>Spirits of Mindererus.</i>
Chloride of	gr. 1-30	<i>Expectorant. Diuretic.</i> In bronchitis.
Valerianate of	gr. 2-8	<i>Stimulant.</i> In hysteria and nervous disorders.
AMYL, Nitrite of	m. 1-3	For inhalation. In angina pectoris; asthma; hiccough.
ARISTOL	Externally	<i>Antiseptic.</i> Used as a dressing for wounds.
<b>ANTIMONY</b>		
Tartar Emetic	{ gr. ½-2 gr. 10-½	<i>Emetic.</i> With strong heart only. <i>Sedative. Expectorant.</i> In inflammatory stage of catarrh.
James' Powder	gr. 3-15	<i>Emetic.</i>
Wine of	m. 5-60	<i>Expectorant.</i> Promotes all the secretions.
ANTIPYRIN	gr. 5-20	<i>Antipyretic.</i> In fevers. <i>Anodyne.</i> In neuralgia.
<b>APOCYNUM</b>		
(Canadian hemp)	gr. 10-20	<i>Emetic. Cathartic.</i> In dropsy.
APOMORPHINE	gr. 10-10	<i>Emetic.</i> Hypodermically in opium poisoning.
<b>ARGENTUM (Silver)</b>		
Nitrate of	gr. ¼-1	<i>Astringent.</i> In chronic dysentery, etc.
Fused	Externally	"Lunar Caustic." To destroy granulations.
<b>ARNICA (Flowers)</b>		
Liniment	Externally	For bruises and superficial wounds.
<b>ARSENIC</b>		
	gr. 10-10	<i>Tonic. Alterative.</i> In debility and anæmia.
Fowler's Solution	m. 2-10	Chronic diseases of skin.
Donovan's Solution	m. 1-10	Neuralgia; malaria; nervous disorders.
<b>ASSAFÆTIDA. Pills</b>		
Tincture of	gr. 5-10 f 3 ½-1	<i>Stimulant. Expectorant. Anti-spasmodic.</i> In hysteria; chorea, flatulent colic, and nervous spasms.
ATROPINE	.....	See BELLADONNA.
<b>AURUM. (Gold.)</b>		
And Soda	gr. 10-10 gr. 10-10	<i>Alterative.</i> In syphilis; nervous disorders.

NAMES AND FORMS.	DOSES.	USES.
BALSAMS	.....	See TOLU—PERU—FIR.
BELLADONNA (Leaves)	gr. 1-5	<i>Anodyne. Narcotic.</i> In asthma,
Solid extract of	gr. $\frac{1}{8}$ - $\frac{1}{2}$	nervous spasm, incontinence of urine. Antidote to opium poisoning.
Fluid “ of	m. 1-3	Checks sweating.
Tincture of	m. 5-30	
Ointment of	Externally	
Atropine	gr. $\frac{1}{200}$ - $\frac{1}{60}$	<i>Hypodermic.</i> Combined with morphine.
BENZOIN	gr. 10-20	<i>Preservative. Expectorant. Anti-septic.</i> Stimulates the mucous membrane.
Tincture of	f 3 $\frac{1}{2}$ -1	
Friar's balsam	f 3 $\frac{1}{2}$ -1	
BERBERINE	.....	<i>Antiseptic.</i> Injection for urethra.
Hydrochlorate (Hydrastin)	gr. 1-5	
BISMUTH (Metal)		<i>Sedative. Astringent</i> (slightly).
Subcarbonate of }	gr. 5-60	In nausea and “sour stomach,”
Subnitrate of }		diarrhœa, gastric ulcer.
Dermatol	gr. 5-10	<i>Antiseptic.</i> Substitute for iodoform.
BLACK HAW (Viburnum)	3 $\frac{1}{4}$ -1	<i>Tonic. Uterine Sedative.</i> Used to prevent abortion.
Fluid extract of	f 3 $\frac{1}{4}$ -1	In painful menstruation.
BLACK WASH	.....	See HYDRARGYRUM.
BLOOD ROOT	.....	See SANGUINARIA.
BLUE OINTMENT }	.....	See HYDRARGYRUM.
BLUE MASS }		
BORAX (sodii boras)	gr. 5-30	<i>Antiseptic.</i> Mouthwash; thrush; gargle; foul ulcers.
BORGLYCERIDE	Externally	<i>Antiseptic.</i> Diluted 5-20%.
BROMOFORM	m. 1-5	<i>Anæsthetic.</i> Whooping cough; externally in foul ulcers.
BROMIDES	.....	See POTASSIUM, SODIUM, AMMONIUM.
BUCHU (Leaves)	gr. 15-30	<i>Stimulant. Diuretic. Tonic.</i>
Fluid extract of	m. 15-30	Chronic inflammation of bladder and urethra.
Tincture of	f 3 1-2	
BUCKTHORN (Frangula)	3 $\frac{1}{2}$ -2	<i>Cathartic.</i> In chronic constipation.
Fluid extract of	3 $\frac{1}{2}$ -2	
CAFFEINE (Thein)	gr. 1-5	<i>Nerve Stimulant.</i> Hypodermically in opium poisoning.
Citrate of	gr. 2-8	In headaches.
CALABAR BEAN		
(Physostigma)	gr. $\frac{1}{2}$ -2	<i>Sedative. Laxative.</i> Acts on spinal cord. In tetanus; strychnine poisoning; general paralysis.
Physostigmine	gr. $\frac{1}{100}$ - $\frac{1}{30}$	Contracts pupil.
CALOMEL	.....	See HYDRARGYRUM.

NAMES AND FORMS.	DOSES.	USES.
CALCIUM (metal)	.....	See LIME.
CAMPHOR (gum)	gr. 3-20	<i>Stimulant. Anodyne.</i> To relieve
Water of	f 3 ½-2	spasm or cramp. In painful
Spirits of	f 3 ½-1	menstruation; cholera; colic;
		diarrhœa; headache. The spirit
		inhaled in syncope.
Hope's mixture	f 3 1-4	In diarrhœa.
Monobromate of	gr. 2-10	
Liniment of	Externally	<i>Rubefacient.</i>
CANNABIS INDICA		
(Indian hemp)	gr. 2-5	<i>Anodyne. Hypnotic.</i> In migraine;
Solid Ext. of (pills)	gr. ¼-¾	neuralgia; irritable bladder;
Fluid Ext. of	m. 2-5	tetanus; delirium tremens.
Tincture of	m. 5-30	Action somewhat like opium.
CANTHARIDES (Spanish		
fly)	Externally	<i>Vesicant.</i> To produce blisters
Collodion of	"	for any purpose.
CAPSICUM (red pepper)	gr. 1-8	<i>Local stimulant. Irritant. Car-</i>
Tincture of	m. 5-20	<i>minative.</i> Sluggish stomach;
Fluid Ext. of	m. 1-8	diarrhœa; colic; gargle in ton-
		sillitis.
CARDAMOM (fruit)	gr. 10-15	<i>Aromatic.</i> As flavoring; in flat-
Tincture of	f 3 1-2	ulent colic.
Compound tinct. of	f 3 2-4	
CASCARA SAGRADA	3 ¼-1	<i>Tonic Cathartic.</i> In chronic con-
Fluid Ext. of	f 3 ¼-1	stipation.
CASTOR OIL	f 3 ½-1	<i>Cathartic.</i> Good for children.
CARBOLIC ACID	.....	See ACID.
CATECHU (extract)	gr. 10-30	<i>Astringent.</i> In diarrhœa.
CHALK	.....	See LIME.
CHAMOMILE (flowers)	3 ½-2	<i>Aromatic stimulant.</i> Used in in-
		fusion (tea)
CHARCOAL (animal)	.....	<i>Absorbent. Antiseptic.</i> In poison-
		ing. In poultices on foul
		wounds. Internally in heart-
		burn and indigestion.
CHLORAL, HYDRATE	gr. 5-20	<i>Hypnotic. Sedative.</i> In insomnia;
		convulsions; tetanus; strych-
		nine poisoning; epilepsy, etc.
CHLORALAMID	gr. 10-30	<i>Hypnotic.</i> Safer than chloral.
CHLORODYNE	m. 3-10	<i>Anodyne.</i> To be used with cau-
		tion. Powerful.
CHLOROFORM	m. 5-30	<i>Anæsthetic. Anodyne.</i> Used by
		inhalation chiefly.
CIMICIFUGA (snake-root)	gr. 1-5	<i>Tonic. Anodyne.</i> In heart dis-
Fluid Ext. of	f 3 ½-1	ease; amenorrhœa; muscular
Tincture of	f 3 ½-2	rheumatism; neuralgia; dys-
		menorrhœa; lumbago.

NAMES AND FORMS.	DOSES.	USES.
CINCHONA (Peruvian bark)	gr. 10-60	<i>Antiperiodic. Tonic. Antipyretic.</i>
Infusion of	f 3 1-2	In relaxed condition of the
Fluid Ext. of	m. 10-60	mucous membranes; gastric
Tincture of	f 3 1-4	catarrh; malarial fevers; peri-
Comp. tinct. of	f 3 1-4	odic neuralgia.
Quinine, Sulphate	gr. 1-20	
CITRINE OINTMENT	.....	See HYDRARGYRUM.
COCA (leaves)	3 1-4	<i>Stimulant. Tonic.</i> In debility,
Fluid Ext. of	f 3 1-4	muscular exhaustion; nervous
Wine of	f 3 ½-2	disorders; indigestion.
Cocaine, hydrochlorate	gr. ⅛-2	<i>Local anæsthetic</i> in from 2 to 10 %
		solution. The cocaine habit
		formed by habitual use. Used
		hypodermatically.
COD LIVER OIL	f 3 1-6	<i>Nutritive. Tonic.</i> Can be given
		in emulsion or "sandwich."
CODEINE	.....	See OPIUM.
COLLODION	Externally	<i>Protective.</i> Forms a film over the
		surface. Volatile.
COLOCYNTH (fruit)	gr. 2-8	<i>Tonic cathartic.</i> Powerful hy-
Extract of	gr. ½-2	dragogue. In dropsy. Used in
		comp. cathartic pills.
CONIUM (fruit)	gr. 2-5	<i>Nerve sedative.</i> In spasmodic
Fluid Ext. of	m. 2-5	affections — chorea, tetanus,
		whooping-cough, etc. Locally
		to painful ulcers.
COPAIBA (balsam)	f 3 ¼-2	<i>Diuretic. Expectorant.</i> Bladder
		troubles; gonorrhœa.
COPPER (cuprum)	gr. 2-20	<i>Emetic.</i> Externally to old ulcers.
Sulphate of	gr. ⅛-½	<i>Astringent.</i> In diarrhœa and
		nervous affections.
CORROSIVE SUBLIMATE	.....	See HYDRARGYRUM.
CREASOTE	m. ½-10	<i>Antiseptic.</i> In phthisis; vomit-
		ing; flatulence.
CREOLIN	m. 1-5	<i>Antiseptic.</i> Used chiefly exter-
		nally; in douche or enema.
		Solutions of ¼ to ½ %.
CROTON OIL	m. ¼-2	<i>Cathartic.</i> Very violent. Locally
		as a vesicant.
CUBEBS (fruit)	3 ½-1	<i>Aromatic. Stimulant diuretic.</i>
Fluid Ext. of	f 3 ½-1	<i>Expectorant.</i> In chronic bron-
Tincture of	f 3 ½-3	chitis; nasal catarrh; cystitis.
DANDELION (root)	3 1-4	<i>Bitter tonic. Laxative.</i> In liver
Solid Ext. of	gr. 5-30	troubles.
Fluid Ext. of	f 3 1-4	

NAMES AND FORMS.	DOSES.	USES.
DIGITALIS (leaves)	gr. $\frac{1}{4}$ -3	<i>Heart stimulant. Diuretic.</i> Slows and strengthens heart-beats; heart disease; dropsy. Its action accumulates.
Fluid Ext. of	m. $\frac{1}{4}$ -3	
Infusion of	f 3 1-4	
Tincture of	m. 5-30	
Digitaline	gr. $\frac{1}{80}$ - $\frac{1}{30}$	Hypod. Uncertain in action.
DOVER'S POWDER	.....	See OPIUM.
ELATERIUM (resin)	gr. $\frac{1}{8}$ - $\frac{1}{4}$	<i>Hydragogue Cathartic.</i> In ascites; dropsy; cerebral congestion.
Elaterin	gr. $\frac{1}{20}$ - $\frac{1}{12}$	
EPSOM SALT	.....	See MAGNESIA.
ERGOT OF RYE	3 $\frac{1}{4}$ -1	<i>Excito-motor.</i> Stimulates the contraction of uterus. Checks hæmorrhages. For cerebral hyperæmia.
Solid Ext. of	gr. 5-15	
Fluid Ext. of	f 3 $\frac{1}{2}$ -1	
Wine of	f 3 1-4	<i>Ergotin</i> for use hypodermically.
ETHER, SULPHURIC	m. 5-30	<i>Stimulant. Anæsthetic.</i> Chiefly by inhalation.
Spirits of nitre	f 3 $\frac{1}{2}$ -2	<i>Diuretic, Diaphoretic.</i> Suppression of urine.
Hoffman's anodyne	m. 5-60	<i>Anodyne, Stimulant.</i> Neuralgia; colic.
EUCALYPTUS (leaves)	3 $\frac{1}{2}$ -2	<i>Antiperiodic.</i> In malaria.
Fluid Ext. of	f 3 $\frac{1}{2}$ -2	<i>Tonic, Antiseptic.</i> In chronic catarrhs.
EUPATORIUM (boneset)	3 $\frac{1}{4}$ -1	<i>Bitter tonic, Diaphoretic.</i> Colds and fevers.
FERRUM	.....	See IRON.
GALLIC ACID	.....	See ACID.
GAMBOGE	gr. 1-5	<i>Hydragogue cathartic.</i> In dropsy.
GELSEMIUM (root)	gr. 5-10	<i>Sedative.</i> In inflammations and fevers; insomnia; neuralgia; puerperal convulsions.
Fluid Ext. of	m. 5-10	
Tincture of	f 3 $\frac{1}{4}$ -1	
GENTIAN (root)	gr. 5-30	<i>Bitter tonic.</i> A stomach tonic.
Solid Ext. of	gr. 2-10	Mixed with other bitters and iron.
Fluid Ext. of	m. 5-30	
Tincture of	f 3 1-4	
GINGER (bark)	gr. 5-15	<i>Aromatic stimulant.</i> Mild stimulant in sluggish digestion.
Tincture of	f 3 $\frac{1}{4}$ -1	
GLAUBER'S SALT	.....	See SODIUM.
GLYCERINE	m. 5-60	<i>Preservative, Solvent.</i> In enema and suppository.
GUAIAC (resin)	gr. 5-30	<i>Alterative, Diaphoretic.</i> In rheumatism, gout, quinsy, sciatica, syphilis.
Tincture of	f 3 $\frac{1}{2}$ -1	
Ammoniated tincture of	f 3 $\frac{1}{2}$ -1	
GUAIACOL	m. 2-10	<i>Antiseptic.</i> Uses same as creasote;
HAMAMELIS (Witch Hazel)		<i>Astringent, Tonic.</i> Used in hæmorrhages, hæmorrhoids, and congestions. Used as a wash in bruises, or diluted in leucorrhœa.
Fluid Ext. of	f 3 $\frac{1}{2}$ -2	

NAMES AND FORMS.	DOSES.	USES.
HEMLOCK	.....	See CONIUM.
HEMBANE	.....	See HYOSCYAMUS.
HIVE SYRUP	.....	See SCILLA.
HOFFMAN'S ANODYNE	.....	See ETHER.
HUMULUS (Hops)		
Tincture of	f 3 1-2	<i>Anodyne. Diaphoretic. Tonic.</i> In indigestion, sleeplessness, fevers. Externally as a poultice.
HYDRARGYRUM (Mer- cury)		Metallic mercury is not employed as a remedy, except in gray powder and blue pill, when it is mechanically divided into a very fine powder.
Gray powder	gr. $\frac{1}{2}$ -10	
Blue pill	gr. $\frac{1}{2}$ -15	
Blue ointment	Externally	
White precipitate	"	Mercury as an <i>Alterative, Purgative, and Antiphlogistic.</i> It is the chief remedy in syphilis.
Corrosive Sublimate	gr. $\frac{1}{60}$ - $\frac{1}{10}$	Salivation is most easily produced by Blue Pill and Calomel.
Calomel	gr. $\frac{1}{2}$ -10	<i>Corrosive Sublimate</i> is a powerful disinfectant, and internally it is used in inflammations, membranous croup, etc. <i>Calomel</i> is a mild cathartic. <i>Turpeth mineral</i> in croup as an emetic.
Donovan's Solution	m. 1-10	
Citrine ointment	Externally	
Red Iodide of	gr. $\frac{1}{60}$ - $\frac{1}{10}$	
Turpeth mineral	gr. 2-4	
Black wash	Externally	
HYDRASTIS (Golden seal)	gr. 5-60	<i>Bitter Tonic. Antiperiodic.</i> In dyspepsia and malaria.
Fluid ext. of	m. 5-60	
Hydrastine	gr. $\frac{1}{4}$ - $\frac{1}{2}$	<i>Hæmostatic.</i> In uterine hæmorrhages.
HYOSCYAMUS (leaves)	gr. 5-15	<i>Hypnotic. Sedative. Anodyne.</i>
Solid ext. of	gr. $\frac{1}{2}$ -2	In insomnia, mania, nervous cough, spasmodic affections.
Fluid ext. of	m. 5-15	
Hyoscyamine	gr. $\frac{1}{60}$ - $\frac{1}{10}$	
Hyoscine	gr. $\frac{1}{180}$ - $\frac{1}{100}$	
HYPOPHOSPHITES		<i>Tonic. Restorative.</i> In debility and wasting diseases; tuberculosis; rickets; nervous diseases.
Syrup of	f 3 1-2	<i>Alterative. Antiseptic.</i> In syphilis, scrofula, and glandular enlargements; the tincture is used as a counter-irritant. For internal use the salt is preferred.
IODINE		
Iodide of potassium	gr. 5-60	
Tincture of	m. 1-5	
Ointment of	Externally	
Lugol's Solution	m. 1-10	
ODOFORM	gr. 1-3	<i>Alterative. Antiseptic.</i> Used most externally as an application to wounds and ulcers.
Ointment of	Externally	

NAMES AND FORMS.	DOSES.	USES.
IPECAC (root)	gr. 1-30	<i>Emetic</i> in large doses; <i>Expectorant</i> in small doses; when combined with opium it is <i>Diaphoretic</i> . Syrup used for children in croup and bronchitis. Used in cough mixtures. Wine in small (drop) doses checks vomiting.
Fluid ext. of	m. 1-5	
Dover's Powder	See <i>Opium</i>	
Syrup of	m. 5-60	
Wine of	m. 1-60	
IRON (Ferrum)		
Quevenne's iron	gr. 1-5	<i>Tonic. Astringent.</i> A restorative for the blood, increasing the number of red blood discs and the proportion of hæmoglobin. The <i>chloride</i> and <i>sulphate</i> are astringent and hæmostatic. The <i>iodide</i> is used where the effects of iodine are wanted. <i>Dialyzed</i> iron is used in arsenical poisoning. The <i>albuminate</i> is most easily assimilated.
Acetated tinct. of	m. 5-30	
Basham's mixture	f 3 1-4	
Carbonate of	gr. 2-10	
Vallet's mass	gr. 1-5	
Solution of Chloride	m. 2-10	
Tincture of "	m. 5-60	
Citrate of	gr. 1-5	
Citrated wine of	f 3 1-2	
Ammonia Citrate and	gr. 1-5	
Quinia " "	gr. 2-10	
Strychnia " "	gr. 1-3	
Hypophosphite of	gr. 2-10	
Iodide of	gr. 5-15	
Syrup of Iodide of	m. 5-30	
Ferric hydrate	3 1-4	
Sulphate of	gr. 1-2	
Monsel's Solution	m. 2-10	
Iron alum	gr. 2-10	
Valerianate of	gr. 1-3	
Griffith's mixture	f 3 2-4	
Wine of	f 3 1-2	
Dialyzed	m. 10-30	
Albuminate of	gr. 10-30	
JALAP (root)	gr. 5-20	<i>Hydragogue Cathartic.</i> Used in dropsy; at commencement of fevers; inflammation.
Extract of	gr. 2-8	
JAMAICA DOGWOOD	gr. 15-30	<i>Narcotic. Sedative.</i> In neuralgia; whooping cough; mania.
Fluid ext. of	m. 15-30	
JUNIPER (berries)	3 ¼-1	<i>Stimulant diuretic.</i> In action like turpentine. In dropsy; catarrh of the bladder.
Oil of	m. 2-10	
Spirits of	f 3 ½-1	<i>Astringent.</i> In diarrhœas; as a gargle.
KINO (juice)	gr. 5-30	
Tincture of	f 3 ¼-2	<i>Stimulant.</i> Similar to coffee in action. In heart disease.
KOLA (nut)	gr. 5-60	
Tincture of	f 3 ½-2	<i>Anthelmintic.</i> To remove tape-worm.
KOUSSO (flowers)	3 2-4	
Fluid ext. of	f 3 1-4	



NAMES AND FORMS.	DOSES.	USES.
LAUDANUM	.....	See OPIUM.
LEAD (metal)		<i>Astringent. Sedative.</i> Internally
Sugar of (acetate)	gr. $\frac{1}{2}$ -5	in hæmorrhages. Usually ex-
Goulard's ext.	Externally	ternally to irritable ulcers and
		in skin diseases.
LEPTANDRA (root)	$3\frac{1}{4}$ -1	<i>Tonic laxative.</i> In liver disorders ;
Leptandrin	gr. $\frac{1}{2}$ -3	constipation.
LIME (calcium)		<i>Caustic. Disinfectant.</i> Lime water
Lime water	f 3 1-8	is used to correct acidity in
Carron oil	Externally	diarrhœas, vomiting. Carron
		oil used in burns and scalds.
LIQUORICE ROOT (powd.)		<i>Expectorant.</i> Used in cough mix-
Brown mixture	f 3 1-4	tures ; to conceal the taste of
Compound powder	$3\frac{1}{2}$ -2	quinine ; comp. powder con-
		tains senna and is a mild lax-
		ative.
LITHIUM (metal)		<i>Diuretic. Antacid.</i> In gout ; uric
Bromide of	gr. 5-20	acid diathesis ; a strong alkali.
Citrate of	gr. 5-20	
LOBELIA (leaves)	gr. 1-10	<i>Emetic. Expectorant. Narcotic.</i>
Fluid Ext. of	m. 1-10	Too harsh for general use ; used
Tincture of	m. 5-30	as antispasmodic ; in asthma
		and bronchitis.
MAGNESIA	gr. 5-60	<i>Antacid. Laxative. Diuretic.</i> Sul-
Carbonate of	$3\frac{1}{4}$ -2	phate or Epsom Salt is cathar-
Epsom salt	$3\frac{1}{4}$ -1	tic ; in acidity, fevers, dropsies,
		dysentery, etc.
MALE FERN (bark)	$3\frac{1}{2}$ -2	<i>Anthelmintic.</i> To destroy tape-
Oil of	f $3\frac{1}{4}$ -1	worm.
MENTHOL	.....	See PEPPERMINT.
MERCURY	.....	See HYDRARGYRUM.
MORPHINE	.....	See OPIUM.
MYRRH (resin)	gr. 5-30	<i>Stimulant tonic.</i> In anæmia ;
Tincture of	m. 15-60	amenorrhœa ; catarrh, etc.
NAPHTOL (from coal tar)	Externally	<i>Antiseptic.</i> Neither poisonous nor
		corrosive.
NITRE	.....	See POTASSIUM.
NITRO-GLYCERIN	gr. $\frac{1}{100}$ - $\frac{1}{1000}$	
Spirits of	m. 1-3	<i>Heart stimulant.</i> In nervous dis-
		eases depending upon arterial
		tension ; in heart diseases.
NUX VOMICA (seed)	gr. 1-4	<i>Bitter tonic. Stimulant.</i> In ner-
Fluid Ext. of	m. 1-4	vous diseases ; dyspepsia ; con-
Tincture of	m. 5-20	stipation ; paralysis.

NAMES AND FORMS.	DOSES.	USES.
OPIUM (juice)	gr. $\frac{1}{4}$ -2	<i>Stimulant. Anodyne. Hypnotic.</i>
Laudanum	m. 3-20	<i>Narcotic.</i> Stimulant in small
Paregoric	m. 3-f 3 4	doses ; it increases perspiration
Dover's Powder	gr. 3-15	but checks other secretions ;
Black drop	m. 3-20	after effects are headache, nau-
Wine of	m. 3-20	sea and constipation. Used to
Morphine	gr. $\frac{1}{8}$ - $\frac{1}{4}$	relieve pain and spasm.
OX GALL	gr. 5-15	<i>Tonic. Laxative.</i> In constipation.
PANCREATIN	gr. 5-15	<i>Digestant.</i> Aids to digest starches
		and fats.
PARALDEHYDE	f 3 $\frac{1}{4}$ -1	<i>Hypnotic. Diuretic.</i> Less power-
		ful but safer than chloral.
PAREGORIC	.....	See OPIUM.
PEPPERMINT (leaves)	.....	<i>Aromatic Stimulant.</i> In flatu-
Oil of	m. 1-5	lence, colic, nausea. Menthol
Spirits of	m. 5-15	applied locally for neuralgia,
Menthol	Externally	headache.
PEPSIN	.....	<i>Digestant.</i> Aids stomach diges-
Saccharated	gr. 5-60	tion.
PEROXIDE OF HYDROGEN	Externally	<i>Disinfectant.</i> Locally in diph-
		theria, wounds.
PERU BALSAM	m. 10-50	<i>Stimulant.</i> To indolent ulcers.
PHENACETINE	gr. 2-10	<i>Antipyretic. Anodyne.</i>
PHENOL	.....	See ACID, CARBOLIC.
PHOSPHORUS	gr. $\frac{1}{100}$ - $\frac{1}{20}$	<i>Nerve stimulant.</i> As a restorative
Oil of	m. 1-5	tonic. Used in the form of
		hypophosphites.
Phosphoric acid	.....	See ACID.
PHYSOSTIGMA	.....	See CALABAR BEAN.
PILOCARPUS	gr. 5-60	<i>Diaphoretic.</i> In acute catarrh and
Fluid Ext. of	m. 5-60	inflammations.
Pilocarpine	gr. $\frac{1}{8}$ - $\frac{1}{2}$	<i>Hypodermically.</i>
PODOPHYLLIN	gr. $\frac{1}{8}$ -1	<i>Cathartic.</i> In liver torpor ; con-
		stipation.
POTASSIUM (metal)		
Acetate of	gr. 5-60	The action of potash salts depends
Cream of Tartar	3 $\frac{1}{2}$ -4	largely upon their combination ;
Bromide of	gr. 5-60	they are nearly all <i>laxative</i> ;
Carbonate of	gr. 5-30	chlorate is an <i>alterative</i> and <i>de-</i>
Chlorate of	gr. 3-20	<i>odorizer</i> ; nitrate is <i>diuretic</i> ;
Citrate of	gr. 5-30	bromide is a nervous <i>sedative</i> ,
Rochelle Salt	3 $\frac{1}{4}$ -1	and especially efficient in epi-
Seidlitz powder	.....	lepsy ; iodide is <i>alterative</i> .
Nitrate of (nitre)	gr. 5-20	
Sulphate of	3 $\frac{1}{2}$ -4	
Iodide of	gr. 5-60	
Permanganate of	gr. $\frac{1}{2}$ -2	

NAMES AND FORMS.	DOSES.	USES.
PRUSSIC ACID	.....	See ACID HYDROCYANIC.
PRUNUS VIRGINIANA	.....	See WILD CHERRY.
QUASSIA (wood)		
Fluid Ext. of	f 3 $\frac{1}{4}$ -1	<i>Bitter tonic. Anthelmintic.</i> Used
Tincture of	f 3 $\frac{1}{2}$ -2	in dyspepsia and diarrhœa;
Infusion of	f 3 1-2	enema of infusion for thread
		worms.
QUININE	.....	See CINCCHONA.
RED CEDAR	.....	See JUNIPER.
RED PRECIPITATE	.....	See HYDRARGYRUM.
RHUBARB (root)	gr. 3-30	<i>Tonic. Laxative. Astringent.</i> In
Fluid Ext. of	f 3 $\frac{1}{4}$ -1	small doses tonic; in larger
Syrup of	f 3 1 (child)	doses laxative; in diarrhœa,
Tincture of	f 3 1-4	dyspepsia, liver troubles, and
		constipation.
ROCHELLE SALT	.....	See POTASSIUM.
SACCHARIN	gr. 1-8	<i>Antiseptic.</i> Used as a sweetening
		agent in diabetes; is 280 times
		sweeter than sugar.
SALICIN	gr. 5-30	<i>Tonic. Antiperiodic.</i> In rheuma-
		tism; malaria.
SALOL	gr. 5-30	<i>Antiseptic.</i> In vomiting, diar-
		rhœa, etc.
SALTPETRE		See POTASSIUM NITRATE.
SANTONIN	gr. $\frac{1}{4}$ -5	<i>Anthelmintic.</i> To remove round
		worms.
SARSAPARILLA (root)	3 $\frac{1}{2}$ -1	<i>Tonic. Alterative.</i> Very feeble
Fluid Ext. of	f 3 $\frac{1}{2}$ -1	powers.
SCILLA (Squill)	gr. 1-5	<i>Diuretic. Expectorant. Emetic.</i>
Vinegar of	m. 10-45	It slows the pulse and increases
Syrup of	f 3 $\frac{1}{2}$ -1	urine. In bronchitis, croup,
Hive Syrup	m. 5-30	and dropsy. Hive syrup con-
		tains <i>tartar emetic</i> .
SEIDLITZ POWDER		See POTASSIUM.
SENNA (leaves)	3 1-3	<i>Cathartic.</i> Efficient and safe.
Fluid Ext. of	f 3 1-3	
Syrup of	f 3 $\frac{1}{4}$ -1	
Black draught	f 3 1-2 $\frac{1}{2}$	
SERPENTARIA (Virginia		
snake-root)	gr. 10-30	<i>Stimulant. Tonic.</i> In diphtheria;
Fluid Ext. of	m. 10-30	bronchitis; low fevers, etc.
Tincture of	f 3 $\frac{1}{2}$ -2	

NAMES AND FORMS.	DOSES.	USES.
SODIUM (metal)		
Benzoate of	gr. 5-60	Action is quite similar to potassium salts. They are feeble alkalies; and are better tolerated by the stomach; they are eliminated more slowly, hence are not as diuretic. The benzoate and borax are <i>antiseptic</i> ; bromide is sedative; the citrate, nitrate, phosphate, and Glauber's salt are <i>laxative</i> ; the salicylate is useful in rheumatism.
Bicarbonate of	gr. 5-60	
Borax	gr. 5-30	
Bromide of	gr. 5-60	
Iodide of	gr. 5-30	
Phosphate of	gr. 5- $\frac{3}{4}$ I	
Salicylate of	gr. 5-30	
Glauber's salt	3 I-8	
SOMNAL	m. 15-30	<i>Hypnotic. Sedative.</i> Action similar to chloral.
SPIGELIA (pink-root)	3 $\frac{1}{4}$ -2	<i>Anthelmintic.</i> Combined with a cathartic to expel round worms ( <i>Ascarides</i> ).
Fluid Ext. of	f 3 $\frac{1}{4}$ -2	
Worm-tea	f $\frac{3}{4}$ I-5	
SQUILL	.....	See SCILLA.
STILLINGIA (root)	3 $\frac{1}{4}$ -I	<i>Alterative.</i> In large doses <i>emetic</i> and <i>cathartic</i> ; in liver troubles, scrofula, syphilis.
Comp. Syrup of	f 3 I-8	
STRAMONIUM	gr. 1-5	<i>Narcotic. Anodyne.</i> Leaves used as fumigator in asthma; action similar to Belladonna.
Fluid Ext. of	m. 1-3	
Tincture of	m. 5-30	
STROPHANTHUS (seeds)		
Tincture of	m. 2-10	<i>Heart stimulant. Diuretic.</i> Acts on the heart like digitalis, but does not affect blood-vessels.
STRYCHNINE	gr. $\frac{1}{80}$ - $\frac{1}{16}$	<i>Bitter tonic. Nerve stimulant.</i> Action same as nux vomica, from which drug it is obtained.
SULPHONAL	gr. 5-30	<i>Hypnotic.</i> Acts slowly; safer than chloral.
SULPHUR (brimstone)		
Flowers of	3 $\frac{1}{4}$ -I	<i>Laxative. Alterative.</i> In chronic rheumatism; neuralgia; skin diseases, etc.
Iodide of	gr. 1-4	
TANSY (leaves)	3 $\frac{1}{4}$ -I	<i>Emmenagogue. Anthelmintic.</i> Dangerous in large doses.
Oil of	m. 1-3	
TAR (from pine)	3 $\frac{1}{4}$ -I	Externally in skin diseases; atomized in catarrh, bronchitis, etc., in the form of syrup.
Syrup of	f 3 I-4	
Oil of	Externally	
TARAXACUM (dandelion)	3 I-4	<i>Bitter tonic. Diuretic. Laxative.</i> In liver disorder; dyspepsia.
Solid Ext. of	gr. 5-30	
Fluid Ext. of	f 3 I-4	
TARTAR EMETIC	.....	See ANTIMONY.

NAMES AND FORMS.	DOSES.	USES.
THEINE	.....	Similar to CAFFEIN.
THYMOL	gr. 1-15	<i>Antiseptic.</i> To inhale and in ointments.
TOLU (balsam)	m. 10-30	<i>Stimulant Expectorant.</i>
Syrup of	f 3 $\frac{1}{2}$ -1	
TRIONAL	gr. 5-20	<i>Hypnotic.</i> Acts quicker than sulfonal.
TURPENTINE		
Oil of	m. 5-30	<i>Stimulant. Diuretic. Cathartic.</i>
Liniment of	Externally	In typhoid conditions; intestinal ulcerations; externally a counter-irritant.
TURPETH MINERAL	.....	See HYDRARGYRUM.
VALERIAN (root)	gr. 10-30	<i>Stimulant. Antispasmodic.</i> In chorea; hysteria; headaches; nervous disorders.
Fluid Ext. of	m. 10-30	
Ammoniated tincture of	f 3 $\frac{1}{2}$ -2	
VERATRUM VIRIDE (bark and root)	gr. 1-5	<i>Sedative.</i> Reduces the pulse in force and frequency; similar to aconite.
Tincture of	m. 2-10	
VIBURNUM (black haw)		
Fluid Ext. of	f 3 $\frac{1}{4}$ -1	<i>Tonic. Uterine sedative.</i> Used to prevent abortion.
WARBURG'S TINCTURE	f 3 2-6	<i>Antiperiodic.</i> A compound tincture of quinine.
WILD CHERRY (bark)	3 $\frac{1}{2}$ -1	<i>Bitter tonic.</i> Contains prussic acid which makes it sedative. In coughs; dyspepsia.
Syrup of	f 3 1-4	
XYLOL	gr. 15-45	<i>Antiseptic.</i>
YERBA SANTA (leaves)	gr. 15-30	<i>Stimulant Expectorant.</i> In chronic coughs.
Fluid Ext. of	m. 15-30	
ZINC		
Oxide of	gr. 1-5	<i>Astringent, Tonic.</i> In nervous diseases—hysteria, epilepsy, etc.
Phosphide of	gr. $\frac{1}{10}$ - $\frac{1}{2}$	
Sulphate of	gr. $\frac{1}{2}$ -30	Sulphate and acetate act as astringents. In weak solutions applied to inflamed mucous surfaces.
Valerianate of	gr. $\frac{1}{2}$ -3	

## ALIMENTARY PREPARATIONS FOR THE SICK.

## LIGHT DRINKS.

**TOAST WATER.**—A slice of stale bread,  $\frac{1}{2}$  inch thick, toasted brown; pour upon it a pint of boiling water; cover closely and cool; strain it. A slice of lemon may be added.

**RICE WATER.**—Boil 2 ounces of rice in 2 quarts of water an hour and a half; add sugar and nutmeg, or salt, to taste. Used in diarrhœa, dysentery, etc.

**BARLEY WATER.**—Wash 2 ounces pearl barley with cold water; boil in  $1\frac{1}{2}$  pints water for 20 minutes in a covered dish; strain, sweeten, and add lemon if permitted.

**EGG WATER.**—Into  $\frac{1}{2}$  pint ice-water gently stir the whites of 2 eggs; sugar or salt to taste.

**APPLE WATER.**—To  $\frac{1}{2}$  dozen sour apples, sliced, add  $\frac{1}{2}$  ounce sugar and a quart of boiling water. Cover closely and cool; strain.

**ACACIA DRINK.**—Make a solution of an ounce of gum acacia in a pint of boiling water; add juice of a lemon, an ounce of sugar, and a wine-glass of sherry; cool and ice.

**FLAXSEED LEMONADE.**—3 tablespoonfuls whole cleaned flaxseed, 2 tablespoonfuls of sugar in a pint of boiling water; steep for an hour; strain and add lemon to taste. Serve cold.

**PANADA.**—Made same as toast, except that the toast remains and the mixture is seasoned to taste.

**BRAN TEA.**—Steep a pint of bran (preferably wheat) in a quart of boiling water for an hour; strain and season to taste.

**CORN TEA.**—Roast sweet corn kernels and grind coarsely as for coffee. To a cupful add 2 cups boiling water and steep. Season.

**RHUBARB WATER.**—Cut up a stalk of rhubarb into thin slices and cover with a cupful of boiling water; let it stand until cold, and add a tablespoonful of sugar; strain.

**LEMONADE.**—Squeeze out the juice of a lemon, and add a tablespoonful of sugar; mix with ice-water and strain; rub the rim of the glass with a slice of lemon peel and allow it to float.

**TAMARIND WATER.**—Add a pint of hot water to a tablespoonful of preserved tamarinds and set aside to cool; strain.

IMPERIAL DRINK.—A tablespoonful of cream of tartar, juice of a lemon, and 2 tablespoonfuls of sugar added to a quart of boiling water and allowed to stand until cool, then serve ice-cold.

#### FROZEN PREPARATIONS.

ICE CREAM.—Boil 1 pint of milk ; mix  $\frac{1}{2}$  cup of sugar, a tablespoonful of flour, and a saltspoonful of salt together ; add 1 egg and beat well ; add the boiling milk and pour all back into the boiler ; cook twenty minutes, stirring often ; then cool. When cold add a quart of cream, and sugar if necessary ; flavor and strain ; freeze. For freezing mixture use 1 part rock salt and 3 parts fine ice.

SHERBET.—Soak a tablespoonful of gelatine in  $\frac{1}{4}$  cup cold water 20 minutes ; add  $\frac{1}{2}$  cup boiling water, juice of 6 lemons, a pint of sugar, and 3 cups cold water ; strain and freeze.

FROZEN BEEF-TEA.—Place the required amount of beef-tea in a bottle in a freezer, and freeze as for ice-cream. Useful in cholera infantum, etc.

TO KEEP ICE.—Cut a piece of clean flannel 8 inches square ; put this over the top of a tumbler, pressing the flannel down half-way ; then tie it fast ; put ice in the flannel ; lay on the top another piece of flannel.

#### BEEF PREPARATIONS.

BEEF-TEA (NO. 1).—To  $\frac{1}{2}$  pound lean beef cut fine, add  $\frac{1}{3}$  pint cold water, and soak 12 hours. Remove the meat and simmer 2 hours in  $\frac{2}{3}$  pint of cold water ; strain and pour the hot liquor upon the cold liquor in which the meat was soaked. If the *whole* of the beef is desired, the meat is dried, powdered in a mortar and mixed with the liquor.

BEEF-TEA (NO. 2).—To 1 pound lean beef, cut fine, add 1 pint cold water and 5 drops muriatic acid ; put it into a jar ; place the jar in a kettle of water at 110° F., and keep in that temperature 2 hours ; strain and season.

PEPTONIZED BEEF-TEA.—Add 10 grains of pepsin and several drops of muriatic acid to half a pound of lean beef cut up fine ; put in a jar and cover with 6 ounces cold water ; let it stand at



a temperature of about 90° F. for two hours, frequently agitating it ; strain and serve cold. It should be made at least twice a day.

**BROILED BEEF ESSENCE.**—Broil half a pound round steak until the juice flows (3 minutes) ; cut into small pieces ; squeeze the juice into a warm bowl ; salt and serve. By adding half a cup of warm water it makes a beef-tea.

**BOUILLON.**—Take beef-tea while moderately hot ; beat up an egg and add the beef-tea gradually, while stirring, and season.

**BEEF-TEA WITH OATMEAL.**—A cupful of strong beef-tea added to tablespoonful of oatmeal gruel mixed in 2 of boiling water, then bring to the boiling point ; salt and serve with toast or crackers.

**BEEF ESSENCE.**—A pound of lean beef without fat, cut very fine, is placed in a jar and corked or sealed tightly ; the jar is set in a kettle of cold water and boiled for 3 hours ; strain and season.

#### OTHER MEATS AND MOLLUSCS.

**CHICKEN BROTH.**—Clean, skin, and cut up the chicken, breaking the bones with a hammer ; remove the fat ; cover with cold water, adding a tablespoonful of salt and a salt-spoonful of pepper ; simmer for 3 or 4 hours until the chicken is tender ; strain, remove the fat. Rice can be cooked with it if desired, and if allowed the best of the meat can be returned to the broth.

**MUTTON BROTH.**—Two pounds of lean mutton without fat or skin is boiled in 3 pints of cold water, heating slowly for 2 hours ; then is added a teaspoonful of salt and a pinch of pepper ; when the meat is in shreds strain, and when cool remove the fat ; if desired, while the broth is boiling, add 2 tablespoonfuls of rice.

**OYSTER BROTH.**—Mince finely a pint of oysters ; let them simmer in a  $\frac{1}{2}$  pint of cold water for 15 minutes over a slow fire ; skim, strain, and season.

**OYSTER BROTH No. 2.**—Melt a tablespoonful of butter in a sauce-pan and add 2 tablespoonfuls of flour, mixing well ; add  $\frac{1}{2}$  a cup of hot milk and mix ; add another cup of milk and

bring to boiling point ; add 1 pint oysters with liquor ; boil until done and season.

OYSTER STEW.—Carefully select and clean 1 quart oysters by adding  $\frac{1}{2}$  cup cold water ; drain and boil the liquor, removing the scum ; when clear put in the oysters ; let them simmer until they grow plump and the edges curl ; then add 1 pint hot milk, 1 tablespoonful of butter, salt and pepper to taste.

CLAM BROTH.—Let from 3 to 6 clams, according to size, stand in boiling water till the shells open ; drain out the liquor, add an equal quantity of boiling water, a teaspoonful of powdered cracker, a little butter, and season.

#### PREPARATION OF EGGS.

BOILED EGGS.—Get the water in a saucepan to a boiling point ; then put in the eggs and note time ; keep just at or below boiling point ; an egg to be cooked soft should be in boiling water 3 minutes ; but it is better to have it in water just below the boiling point for 8 minutes, when the egg will be cooked throughout more uniformly.

DROPPED EGGS.—Toast a slice of bread for each egg, and trim neatly ; have a shallow pan nearly full of salted and boiling water ; break each egg carefully into the water ; dip the water over them with a spoon, and when a film has formed on the yolk and the white is firm, take each up with a skimmer, drain and place on the toast ; do not allow the water to boil ; put a bit of butter and a little salt and pepper on each egg.

EGG BROTH.—Pour a pint of boiling water on an egg well beaten up with half a teaspoonful of sugar, stirring well to keep it from curdling ; season and serve hot.

EGG-NOGG.—Beat up 1 egg with 1 even tablespoonful of sugar ; add 1 tablespoonful of whiskey, or brandy, or sherry wine ; add  $\frac{1}{2}$  cup of cream or milk ; grate a little nutmeg on surface. Or, beat the white of an egg to stiffness ; stir into it a tablespoonful of sugar ; then the yolk of the egg ; a tablespoonful each of ice-water, milk, and wine ; lightly stir.

HOT EGG-NOGG.—The yolk of an egg and a tablespoonful of sugar are beaten together and stirred into a pint of milk at the boiling point ; add a tablespoonful of brandy or whiskey and grate a little nutmeg on top.

**CUSTARD.**—Scald 1 pint of milk ; beat 3 eggs well, add 3 tablespoonfuls of sugar and a little salt ; pour on hot milk and boil in a water bath until thick ; strain, cool, and add 1 teaspoonful of flavoring.

**OMELET.**—Beat 4 eggs slightly ; add 4 tablespoonfuls milk,  $\frac{1}{2}$  teaspoonful salt, a little pepper, and mix well, cook in a hot buttered pan, lifting up with a fork the cooked egg from the center and let the uncooked flow in ; continue this until the whole is of a creamy consistency ; fold over and turn out.

**EGG LEMONADE.**—2 tablespoonfuls of sugar is beaten up with an egg thoroughly and then mixed with 3 tablespoonfuls of cold water and the juice of a lemon ; put broken ice in the glass and fill with ice-water.

**EGG AND COFFEE.**—An egg and a tablespoonful of sugar are well beaten together and boiling coffee is gradually added, stirring ; add hot cream.

#### MILK PREPARATIONS.

**MILK TOAST.**—Toast six slices of bread ; melt a large tablespoonful of butter to which add 1 tablespoonful of cornstarch and mix well ; pour on this slowly hot milk, stirring and beating until smooth, and add  $\frac{1}{2}$  a teaspoonful of salt ; pour this over the toast and keep hot until served.

**RICE MILK.**—Boil a tablespoonful of rice for an hour and a half in a pint of fresh milk, then rub it through a fine sieve ; add a teaspoonful of sifted sugar and boil again for a few minutes.

**MILK PUNCH.**—Add 2 teaspoonfuls of sugar and an ounce of brandy or whiskey to half a pint of cold milk ; stir till sugar is dissolved ; some nutmeg can be grated on top, if desired.

**EGG MILK.**—Shake up in a bottle the whites of 2 eggs, a pint of milk and a pinch of salt ; serve cold.

**LIME-WATER AND MILK.**—Take a wineglassful of clear lime-water and two wineglassfuls of fresh milk. To be used when the stomach is irritable.

**ALMOND MILK.**—Boil a  $\frac{1}{4}$  pound fine pounded sweet almonds in a quart of water ; cool and strain through a cloth and sweeten ; it only keeps a few hours.

**SAGO MILK.**—Soak a tablespoonful of sago in 4 of cold water

over night ; boil in a water bath with a quart of milk until the sago is quite dissolved ; sweeten and serve, hot or cold.

POSSETT.—To a cupful of milk at the boiling point add a tablespoonful of molasses, stirring well ; then boil, strain, and serve.

#### MISCELLANEOUS.

WINE WHEY.—Add a wineglassful of sherry to  $\frac{1}{2}$  a pint of boiling milk ; strain, and serve hot ; it may be sweetened if desired.

ARROW ROOT.—Mix a tablespoonful of arrow root with cold water to make a paste ; to a pint of boiling water, stir in the arrow root and boil a few minutes ; sweeten. If desired, brandy, whiskey, or wine may be added, or half milk may be used. The flavor may be improved by adding a little lemon or orange peel before boiling.

FLOUR GRUEL.—To 2 teaspoonfuls of flour add a salt spoonful of salt and make it into a thin paste with cold water ; stir into it 1 cup of boiling water and boil for 5 minutes ; strain and thin with a little milk ; sweeten if desired. If for a fever patient, lemon juice may be added. If for diarrhoea, a small stick of cinnamon may be boiled with the gruel.

INDIAN MEAL GRUEL.—Mix a tablespoonful of flour, 2 tablespoonfuls of corn meal, and a teaspoonful of salt together ; make into a thin paste with cold water and put into 1 quart of boiling water ; boil 1 hour, stirring often ; thin with milk or cream.

OATMEAL GRUEL.—1 cup oatmeal,  $\frac{1}{2}$  teaspoonful salt, one quart boiling water ; boil in a water bath for 2 or 3 hours.

WINE JELLY.—Soak  $\frac{1}{2}$  box gelatine in  $\frac{1}{2}$  cup cold water until soft ; add 1 pint boiling water, 1 cup sugar, juice of 1 lemon, and 1 cup of sherry ; stir well, strain, and cool.

TAPIOCA.—Cover 2 tablespoonfuls of tapioca with a teacupful of cold water and soak for 3 hours ; put it into a pint of boiling water and boil until clear ; sweeten and add nutmeg or wine, if desired.

BLANC-MANGE.—Soak a half cup of Irish moss 15 minutes ; put into a water bath with one quart of milk ; boil until the milk thickens ; when cooled, strain ; add a salt spoonful of

salt and a teaspoonful of flavoring and serve cold with sugar and cream.

**BOILED RICE.**—Wash a cup of rice thoroughly and put it into a kettle containing 2 quarts of boiling water ; boil rapidly, skimming often until the rice is tender ; stir with a fork, so as to preserve the kernels entire ; drain and dry the rice in the strainer ; season and serve with milk or cream.

**COFFEE.**—Scald the coffee-pot ; allow a heaping tablespoonful of coffee for each cup of boiling water ; slightly beat up 1 egg and add the coffee and crushed shell mixed with  $\frac{1}{4}$  of a cup of cold water ; put this in the hot coffee-pot, add the boiling water and boil 5 minutes ; keep it hot but not boiling for 10 minutes ; in serving pour the coffee upon the sugar and cream.

**TEA.**—Allow a teaspoonful of tea to each  $\frac{1}{2}$  pint of water ; scald and heat the tea-pot, which should be earthen ; put in the tea, add water freshly boiled, and keep hot but not boiling for from 3 to 5 minutes.

## A GLOSSARY OF TECHNICAL WORDS AND TERMS.

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- ABDOMINAL RESPIRATION, respiration carried on by the diaphragm and abdominal muscles.
- ABDUCTION, movement from the middle line.
- ABLUTION, cleansing by washing.
- ABNORMAL, contrary to natural law ; morbid.
- ABOLITION, complete suspension.
- ABORTION, premature expulsion of fœtus.
- ABRASION, excoriation of skin.
- ABSCESS, cavity containing pus.
- ABSORPTION, taking up of one body by another.
- ABSTRACTION, blood letting.
- ACCOMMODATION, power of adjusting the eye to different distances.
- ACETIC ACID, acid of vinegar.
- ACHILLES TENDON, common tendon of the muscles of the back of the leg.
- ACOUSTIC, relating to sound.
- ACRID, burning, pungent.
- ACTUAL CAUTERY, the use of white-hot iron.
- ACUPRESSURE, compression of arteries by needles.
- ACUTE, rapid, severe.
- ADDUCTION, movement toward the middle line.
- ADHESION, union of two surfaces.
- ADHESIVE, sticky, tenacious.
- ADIPOSE, fatty.
- ADOLESCENCE, between puberty and maturity.
- ADULT, of full size and strength.
- ADULTERATION, mixture with inferior ingredients.
- AFFERENT, towards the centre.
- AFFINITY, relationship, attraction.
- AFFLUX, flow to a part.
- AFFUSION, pouring upon.
- AFTER-BIRTH, placenta and membranes.
- AFTER-PAINS, post-partum pains.
- AGGLUTINATE, joining together.
- AGORAPHOBIA, dread of open spaces.
- AGRAPHIA, inability to express ideas in writing.
- ALBUMEN, white of egg.
- ALBUMINOID, resembling albumen.
- ALBUMINURIA, presence of albumen in urine.
- ALCOHOLISM, excessive use of alcohol.

- ALIENATION, mental derangement.
- ALIMENTARY, nourishing.
- ALKALI, a substance combining with an acid to form a neutral salt.
- ALKALOID, resembling alkali.
- ALOPECIA, loss of the hair.
- ALTERATIVE, medicines that alter nutrition and excretion.
- ALVEOLUS, bony socket of a tooth.
- AMAUROSIS, partial or total blindness.
- AMENORRHŒA, irregularity of menstruation.
- AMNESIA, loss of memory for words.
- AMORPHOUS, non-crystallized.
- AMPUTATION, removal of a part of the body.
- AMYL NITRITE, a volatile fluid producing vascular dilatation.
- AMYLACEOUS, starch-like.
- ANÆMIA, deficiency of red corpuscles in blood.
- ANÆSTHESIA, state of insensibility.
- ANALGESIA, insensibility to pain.
- ANALOGOUS, conforming to.
- ANALYSIS, resolution into elements.
- ANASARCA, general dropsy.
- ANASTOMOSIS, the junction of vessels.
- ANCHYLOSIS, a stiff joint.
- ANEURISM, dilatation of an artery.
- ANGINA, sense of suffocation.
- ANGINA PECTORIS, oppression about the heart.
- ANGULAR, pertaining to an angle.
- ANHYDROUS, not containing water.
- ANIMALCULÆ, microscopic organisms.
- ANKLE CLONUS, spasmodic contraction of ankle joint.
- ANNULAR, ring like.
- ANODYNE, medicine relieving pain.
- ANOMALOUS, unusual.
- ANOREXIA, loss of appetite.
- ANTAGONIST, a drug neutralizing another.
- ANTEFLEXION, bending forward.
- ANTEVERSION, turning forward.
- AMTHELMINTIC, remedy against worms.
- ANTHONY'S FIRE, erysipelas.
- ANTHRAX, carbuncle.
- ANTIDOTE, counteracting a poison.
- ANTIFEBRILE, reducing fever.
- ANTIPERIODIC, opposed to periods.
- ANTIPHLOGISTIC, agent reducing inflammation.
- ANTIPYRETIC, reducing temperature.
- ANTISEPTIC, preventing putrefaction.
- ANTISPASMODIC, counteracting spasms.
- ANTITOXIN, remedy for diphtheria.
- ANTRUM, a bone cavity.
- ANUS, extremity of rectum.



- AORTA, the main arterial trunk.  
 APATHY, want of feeling.  
 APERIENT, laxative, opening.  
 APERTURE, an opening, orifice.  
 APEX, summit or top.  
 APHASIA, loss of power of speech.  
 APHONIA, loss of voice.  
 APHTHÆ, small white ulcers of mouth.  
 APICES, plural of apex.  
 APNŒA, breathlessness.  
 APOMORPHINE, a powerful emetic.  
 APOPLEXY, a sudden paralysis.  
 APPENDICITIS, inflammation of vermiform appendix.  
 AQUA, water.  
 AQUEOUS, watery.  
 AREOLA, a ring-like discoloration.  
 AROMATIC, spicy, fragrant.  
 ARTHRITIC, pertaining to a joint.  
 ARTICULAR, pertaining to a joint.  
 ARTICULATION, the sounds of speech ; a joint.  
 ASCITES, dropsy of the abdomen.  
 ASEPSIS, absence of septic matter.  
 ASPHYXIA, non-oxygenation of blood.  
 ASTHENIA, loss of strength.  
 ASTRINGENT, producing contraction of tissue.  
 ATAXIA, incoördination of muscles.  
 ATOMIZER, instrument for reducing liquid spray.  
 ATROPHY, wasting of a part.  
 AUDITORY, pertaining to organs of hearing.  
 AURA, peculiar sensation before a fit.  
 AUSCULTATION, listening to sound of organs.  
 AUTOMATIC, not voluntary.  
 AUTOPSY, post-mortem examination.  
 AUXILIARY, aiding, assisting.  
 AXILLA, the arm-pit.  
 BACILLUS, the most important group of bacteria.  
 BACTERIA, micro-organisms ; microbes.  
 BICEPS, two-headed, applied to muscles.  
 BILATERAL, having two equal sides.  
 BILIARY, pertaining to bile.  
 BLAND, mild, non-irritating.  
 BLEB, a large blister.  
 BOLUS, a pill-like mass.  
 BOUGIE, a round instrument for dilating urethra.  
 BOUILLON, a broth or soup.  
 BRIGHT'S DISEASE, inflammation of the kidneys.  
 BRONCHITIS, inflammation of bronchial tubes.  
 BUCCAL, pertaining to the cheek.  
 BULLA, a large blister.  
 BURSA, a small sac between movable parts.  
 BUTTOCKS, the rump or gluteal region.  
 CACHEXIA, depraved condition of nutrition.  
 CADAVER, the dead body.

- CALCAREOUS, having the nature of lime ; stony.
- CALCULUS, stone-like concretion.
- CALISTHENICS, a system of light gymnastics.
- CALLOUS, hard, indurated.
- CALORIC, heat.
- CANCELLOUS, resembling lattice work.
- CAPILLARY, a minute blood vessel.
- CAPSULE, membranous sack enclosing a part.
- CARCINOMA, cancer or malignant tumor.
- CARDIAC, pertaining to the heart.
- CARIES, ulceration of bone.
- CAROTID, great arteries of neck.
- CARPUS, the wrist.
- CARTILAGE, gristle.
- CASEOUS, having the nature of cheese.
- CATAclysm, a sudden shock.
- CATALEPSY, spasms with loss of will and muscular rigidity.
- CATAMENIA, menstruation.
- CATAPLASM, a poultice.
- CATARACT, destruction of lens of the eye.
- CATARRH, inflammation of mucous membrane.
- CATHARTIC, a purgative medicine.
- CATHETERIZATION, emptying bladder with catheter.
- CAUTERY, a substance for destroying a part.
- CAVITY, a hollow, as in the lungs.
- CELLULAR, composed of cells.
- CENTIGRADE, having 100 degrees.
- CENTIMETRE, the hundredth part of a metre.
- CENTRIFUGAL, receding from the centre.
- CEPHALALGIA, pain in the head.
- CEPHALIC, pertaining to the head.
- CERATE, substance with wax as a basis.
- CEREBELLUM, inferior part of the brain.
- CEREBRAL, relating to the brain.
- CEREBRASTHENIA, cerebral neurasthenia.
- CEREBRO-SPINAL, relating to the brain and spine.
- CEBEBRUM, chief portion of the brain.
- CERVICAL, pertaining to the neck.
- CERVIX, the neck.
- CHALYBEATE, containing iron.
- CHEYNE - STOKES RESPIRATION, form of dyspnœa with increased respiration followed by temporary arrest.
- CHILBLAIN, inflammation of skin, due to cold.
- CHLOROSIS, green sickness of young girls.
- CHOREA, St. Vitus' dance.
- CHRONIC, long continued.
- CHYLE, milky fluid of intestinal digestion.
- CHYME, food that has undergone gastric but not intestinal digestion.

- CICATRIX, scar or mark of a wound.
- CIRCULATION, passage of blood through the body.
- CIRCUMSCRIBE, clearly defined.
- CLASSIFICATION, systematic arrangement.
- CLAVICLE, collar bone.
- CLIMACTERIC, critical periods in life.
- CLINICAL, pertaining to a sick bed.
- CLONIC, spasms with alternate relaxation.
- CLYSTER, an enema.
- COAGULUM, a clot of thickened blood.
- COCCYX, last bone of the spinal column.
- COHESION, a sticking together.
- COLIC, spasmodic pain in the abdomen.
- COLLAPSE, a failure of the vital powers.
- COLLODION, solution of gun-cotton in ether.
- COMA VIGIL, delirium with open eyes.
- COMATOSE, in a condition of coma.
- CONDYLE, a rounded eminence.
- CONFLUENT, a running together.
- CONGENITAL, existing from birth.
- CONGESTION, flow of blood to a part.
- CONJUNCTIVA, mucous membrane of the eye.
- CONSTIPATION, a sluggish action of the bowels.
- CONTAGION, transfer of specific disease.
- CONTINUITY, uninterrupted connection.
- CONTRACTILITY, power of contracting or shortening.
- CONTRA-INDICATED, forbidden by peculiarity of disease.
- CONTUSION, a bruise from a blow.
- CONVALESCENCE, period of recovery after disease.
- CONVOLUTION, folding upon itself.
- CONVULSION, involuntary contraction, spasm, fit.
- CO-ORDINATION, harmonious action of muscles.
- CORNEA, transparent anterior part of eyeball.
- CORPULENCY, obesity, largeness of body.
- CORPUSCLE, minute body, cell.
- CORROSIVE, substance that eats away or destroys.
- CORTEX, external gray layer of brain.
- CORTICAL, pertaining to the cortex.
- CORYZA, running at the nose, nasal catarrh.
- COSTAL, pertaining to the ribs.
- COSTIVE, affected with constipation.
- COUNTER-IRRITATION, superficial irritation of body.
- COUP-DE-SOLEIL, sun-stroke.
- COXALGIA, pain in the hip joint.
- CRANIAL, pertaining to the cranium.

CRANIUM, the skull.

CREPITUS, grating of fractured bones.

CRIBRIFORM, perforated like a sieve.

CRISIS, turning-point in a disease.

CRITICAL, pertaining to a crisis.

CROUP, inflammation of air passages with dyspnœa.

CUL-DE-SAC, passage without an outlet.

CURRICULUM, course of study.

CUTANEOUS, pertaining to the skin.

CUTICLE, the epidermis or scarf-skin.

CYANOSIS, blue discoloration of skin.

CYST, a sac containing fluid.

CYSTITIS, inflammation of the bladder.

DEBILITY, weakness.

DECOCTION, preparation obtained by boiling.

DECOMPOSITION, putrefaction.

DECUBITUS, bed sore.

DECUSSATE, to intersect.

DEFECATION, evacuation of bowels.

DEFERVESCE, abatement of fever.

DEFORMITY, physical distortion.

DEGENERATION, deterioration of structure.

DEGLUTITION, act of swallowing.

DEJECTION, discharge of fæces.

DELIQUESCE, liquefaction from water of atmosphere.

DELUSION, false judgment.

DEMENTIA, mental incapacity.

DEMULCENT, mucilaginous substances.

DENTAL, pertaining to teeth.

DEODORIZER, a disinfectant destroying smells.

DEPLETION, diminishing of a body fluid.

DEPRESSION, a depressed condition.

DERIVATIVE, to draw from.

DERMATITIS, inflammation of the skin.

DESICCATION, process of drying.

DESQUAMATION, scaling of the cuticle.

DETERMINATION, direction to a part.

DEVELOPMENT, progression toward maturity.

DIABETIC, pertaining to diabetes.

DIAGNOSIS, recognition of disease.

DIAPHORESIS, production of perspiration.

DIAPHRAGM, muscular wall between thorax and abdomen.

DIASTOLE, dilatation of the heart.

DIATHESIS, constitutional predisposition to disease.

DICROTIC, double beating.

DIETETIC, pertaining to diet.

DIGASTRIC, having two bellies.

DIGESTION, conversion of food for assimilation.

DIGITAL, pertaining to fingers or toes.

- DILATATION, expansion of vessel or organ.
- DILUENT, agent increasing fluidity.
- DIPLOPIA, double vision.
- DIPSOMANIA, uncontrollable desire for alcohol.
- DISCRETE, separate, distinct.
- DISINFECTANT, agent destroying germs.
- DISLOCATION, displacement of joints.
- DISPENSARY, where drugs are kept.
- DISSECTION, separation of the parts of a body.
- DISSOLUTION, death.
- DISTAL, away from the centre.
- DIURESIS, excessive secretion of urine.
- DORSAL, pertaining to the back.
- DRAINAGE, removal of pus.
- DRASTIC, powerful purgative.
- DROPSY, effusion of fluid into tissues.
- DUODENUM, first part of small intestines.
- DURA MATER, outer membrane of brain.
- DYSENTERY, inflammation of large intestine.
- DYSMENORRHŒA, painful menstruation.
- DYSPEPSIA, imperfect digestion.
- DYSPHAGIA, inability to swallow.
- DYSPNŒA, difficult breathing.
- ECCHYMOsis, extravasation of blood.
- ECLAMPSIA, rapid convulsive motion.
- ECSTASY, trance-like state.
- ECZEMA, inflammation of skin.
- EDIBLE, suitable for food.
- EFFERENT, outward from the centre.
- EFFLEURAGE, stroking toward the centre.
- EFFLORESCENCE, redness of skin.
- EFFUSION, fluid in a body or cavity.
- EJECTION, casting out.
- ELIMINATION, excretion.
- ELIXIR, sweetened aromatic preparation.
- EMACIATION, loss of flesh.
- EMANATION, that which proceeds out of a body.
- EMBOLISM, obstruction of blood-vessel by a clot.
- EMBROCATION, a fomentation or liniment.
- EMETIC, an agent causing vomiting.
- EMMENAGOGUE, agent stimulating menstrual flow.
- EMOLLIENT, agent softening tissue.
- EMPHYSEMA, distention of tissues with air.
- EMPYEMA, pus in the pleura.
- EMULSION, milky fluid with oil and water.
- ENCEPHALIC, pertaining to the brain.
- ENDEMIC, a local epidemic.
- ENDOCARDIUM, lining membrane of heart.

- ENEMA, a rectal injection.
- ENERGY, power or force of the organism.
- ENERVATE, to weaken.
- ENGORGEMENT, vascular congestion.
- ENTERALGIA, pain in the bowels.
- ENTERIC, pertaining to the intestines.
- ENTERITIS, inflammation of intestines.
- ENVIRONMENT, surrounding influences.
- EPHEMERAL, lasting but a day.
- EPIDEMIC, common to many people.
- EPIDERMIS, outer layer of skin.
- EPIGASTRIC, over the stomach.
- EPIGLOTTIS, the cover of the larynx.
- EPILEPSY, nervous disease with convulsions.
- EPILEPTIFORM, resembling epilepsy. [nose.
- EPISTAXIS, bleeding from the
- EPITHELIUM, external layer of the skin.
- EROSION, an ulceration.
- ERRATIC, irregular.
- ERUCTATION, belching.
- ERUPTION, a breaking out.
- ERYTHEMA, a blush or redness of the skin.
- ESCHAROTIC, substance producing a dry slough.
- ETHERIZATION, administration of ether.
- ETIOLOGY, study of causes of disease.
- EUTHANASIA, easy death.
- EVACUATION, defecation.
- EXACERBATION, increased severity of symptoms.
- EXANTHEMATOUS, pertaining to eruptions of skin.
- EXCISION, act of cutting away.
- EXCORIATION, abrasion of the skin.
- EXCREMENT, the fæces.
- EXCRESCENCE, abnormal outgrowth on the body.
- EXCRETA, natural discharges of the body.
- EXHALATION, vapor given off by the body.
- EXHAUSTION, great loss of vital power.
- EXOPHTHALMUS, protrusion of eyeballs.
- EXPECTORANT, promoting secretion of mucus.
- EXPECTORATION, coughing ; spitting up.
- EXSANGUINE, bloodless.
- EXTIRPATION, entire removal of the parts.
- EXTRAVASATION, effusion of fluid into the tissues.
- EXTREMITY, a limb or termination.
- EXUDATION, oozing out of fluid.
- FARADIC, the induced electrical current.
- FARINACEOUS, having the nature of flour.
- FASCIA, fibrous membrane covering muscles.

- FAUCES, the throat.
- FEBRICULA, a slight fever.
- FEBRILE, pertaining to fever.
- FECUNDITY, power of producing young.
- FEMUR, the thigh bone.
- FERMENTATION, decomposition produced by organisms.
- FERRIC, of the nature of iron.
- FERRUGINOUS, containing iron.
- FETID, an offensive smell.
- FIBRILLA, a small fibre or filament.
- FIBRIN, substance coagulating in blood.
- FIBROID, having a fibrous structure.
- FIBULA, small bone of leg.
- FILAMENT, thread-like structure.
- FILIFORM, thread-like.
- FILTRATION, process of straining.
- FISSURE, a groove or cleft.
- FISTULA, abnormal tube-like passage.
- FLACCID, soft, flabby.
- FLATULENCE, presence of gas in intestines.
- FLATUS, gas in alimentary canal.
- FLEXIBLE, that which may be bent.
- FLEXION, process of bending.
- FLEXOR, muscle that bends a part.
- FLUCTUATION, wave-like motion.
- FOCUS, principal seat of disease.
- FOLLICLE, a small secretory cavity.
- FOMENTATION, to apply hot liquids to body.
- FONTANELLE, space in the cranium at birth.
- FORAMEN, a passage or opening.
- FORMICATION, a crawling sensation of the skin.
- FORMULA, a concise statement.
- FOSSA, a depression or furrow.
- FRACTURE, breaking of a bone.
- FRIABLE, easily pulverized.
- FRICTION, act of rubbing.
- FRONTAL, pertaining to the anterior part.
- FUMIGATION, disinfectant vapor.
- FUNCTION, special action of a part.
- FUSIFORM, spindle-shaped.
- FUSION, liquefying a solid.
- GALACTAGOGUE, promoting flow of milk.
- GALL, the bile.
- GALVANISM, electricity induced by chemical reaction.
- GANGLION, a lymphatic gland. A nervous centre.
- GANGRENE, mortification of tissue.
- GARGLE, wash for the throat.
- GASEOUS, the nature of gas.
- GASTRALGIA, pain in the stomach.
- GASTRIC, pertaining to the stomach.
- GAVAGE, forced feeding.
- GENERATE, to beget, produce.
- GENITAL, of the organs of generation.
- GERMICIDE, agent destroying germs.



GESTATION, pregnancy.

GLAIRY, slimy.

GLANDULAR, pertaining to a gland.

GLOBULAR, shaped like a globe.

GLOTTIS, space in the larynx.

GLUCOSE, grape sugar.

GLUTEAL, pertaining to the buttocks.

GLYCOSURIA, sugar in the urine.

GOITRE, enlargement of thyroid gland.

GONORRHŒA, contagious inflammation of genitals.

GRADUATE, a glass vessel marked for measurements.

GRANULATION, small elevations on a healing surface.

GRAVEL, sand-like deposit in the urine.

GROIN, depression between thigh and trunk.

GULLET, canal from mouth to stomach.

GUMMA, gummy tumor.

GUSTATORY, pertaining to sense of taste.

GUTTURAL, pertaining to throat.

GYMNASTIC, systematic exercise.

GYNECOLOGY, of the diseases of women.

GYRATION, turning in a circle.

GYRUS, a convolution.

HALLUCINATION, a false perception.

HAUNCH, hips and buttocks.

HÆMATIN, red coloring matter of blood.

ILÆMATINURIA, hæmatin in the urine.

ILÆMOGLOBIN, coloring matter of red corpuscles of the blood.

HÆMOPTYSIS, spitting of blood; bleeding from lungs.

HÆMORRHAGE, flow of blood from vessels.

HÆMORRHOIDS, piles.

HÆMOSTATIC, arresting hæmorrhage.

HIBETUDE, dulness of senses.

HEMIANÆSTHESIA, loss of sensibility on one side.

HEMIANOPSIA, blindness of one half of vision.

HEMICRANIA, neuralgia of half of the head.

HEMIPLEGIA, paralysis of one side of the body.

HEPATIC, pertaining to the liver.

HEPATIZATION, liver-like substance.

HEREDITARY, constitutional tendency.

HERMETIC, sealed; air-tight.

HERNIA, protrusion of bowel.

HERPES, skin disease with vesicles.

HICCUGH, spasmodic inspiration.

HIVES, an eruption of the skin.

HOSPITALISM, morbid influence of a hospital.

HUMERUS, large bone of the upper arm.

HUMIDITY, moisture of the atmosphere.

HUMOR, fluid part of the body.

HYALINE, glassy, crystallized.

- HYDRAGOGUE, causing watery discharges.
- HYDROCARBON, compound form of hydrogen and carbon.
- HYDROCEPHALUS, dropsy of the brain.
- HYDROGEN, a light gaseous element.
- HYDROPHOBIA, fear of water.
- HYDROTHERAPEUTICS, the use of water as a remedy.
- HYDROTHORAX, dropsy of the chest.
- HYGIENE, the science of health.
- HYPERÆMIA, morbid flow of blood to a part ; congestion.
- HYPERÆSTHESIA, excessive sensibility.
- HYPERIDROSIS, excessive sweating.
- HYPERMETROPIA, far-sightedness.
- HYPERTROPHY, abnormal increase of a part or organ.
- HYPNOTIC, remedy causing sleep.
- HYPNOTISM, artificial somnambulism.
- HYPOCHONDRIASIS, morbid anxieties regarding health.
- HYPODERMATIC, underneath the skin.
- HYPOGASTRIC, pertaining to lower abdomen.
- HYPOGLOSSAL, under the tongue.
- HYSTERALGIA, pain in the womb.
- HYSTERECTOMY, excision and removal of the womb.
- HYSTERIA, paroxysms of abnormal sensations.
- ICHOR, an acrid discharge.
- ICTERUS, jaundice.
- IDIOCY, extreme mental deficiency, from lack of development.
- IDIOPATHIC, primary or independent.
- IDIOSYNCRASY, individual peculiarity.
- ILEUM, lower half of small intestine.
- ILLUSION, a false perception.
- IMBECILE, feeble in mind.
- IMMERSION, plunging into a liquid.
- IMMOBILITY, state of being fixed.
- IMMUNITY, freedom from infection.
- IMPACTED, wedged in.
- IMPERVIOUS, not permitting a passage.
- IMPOTENCE, lack of sexual power.
- INANITION, exhaustion from starvation.
- INCISION, act of cutting into.
- INCOHERENT, disconnected ; confused.
- INCOMPATIBLE, not capable of being united.
- INCONTINENCE, involuntary evacuation.
- INCO-ORDINATION, lack of muscular harmony.
- INCUBATION, period between exposure and beginning of disease.
- INDEX, the first finger.
- INDICATION, a sign.
- INDIGESTION, dyspepsia.
- INDISPOSITION, any slight ailment.

- INDURATED, hardened.
- INERTIA, sluggishness.
- INFECTION, communication by disease germs.
- INFERIOR, lower.
- INFILTRATE, to ooze into a tissue.
- INFLATION, distended with air.
- INFLUENZA, a contagious catarrhal fever.
- INFUSION, a watery solution.
- INGESTION, introduction of food into the body.
- INGREDIENT, any part of a compound.
- INGUINAL, pertaining to the groin.
- INHALATION, in-breathing of vapor.
- INHERITED, derived from an ancestor.
- INHIBITORY, having the power to restrain ; voluntary.
- INJECTION, forcing liquid into a cavity.
- INNERVATION, discharge of nervous force.
- INOCULATION, introduction of a virus into the system.
- INORGANIC, without organized structure.
- INSANITY, mental derangement.
- INSENSIBLE, without the sense of feeling.
- INSOLATION, sunstroke.
- INSOLUBLE, incapable of solution.
- INSOMNIA, inability to sleep.
- INSPIRATION, drawing in of air to the lungs.
- INSPISSATED, thickened by evaporation.
- INSUFFLATION, blowing of powder into a cavity.
- INTEGUMENT, the skin.
- INTELLECT, the mind or reasoning power.
- INTERCOSTAL, between the ribs.
- INTERCURRENT, occurring between.
- INTERMISSION, interval between paroxysms.
- INTERMITTENT, occurring at intervals.
- INTERNAL, on the inside.
- INTEROSSEOUS, between bones.
- INTERSTICES, spaces or intervals.
- INTESTINAL, pertaining to the intestines.
- INTOLERANCE, great susceptibility to drugs.
- INTRACAPSULAR, within the capsule of a joint.
- INTRACRANIAL, within the skull.
- INTUBATION, insertion of tube in larynx.
- INTUSSUSCEPTION, slipping of one part of intestine into another.
- INUNCTION, rubbing in an ointment.
- INVALID, one who is not well.
- INVASION, onset of a disease.
- INVERSION, turning inside out ; or upside down.
- INVOLUNTARY, independent of the will.
- INVOLUTION, rolling or turning in.
- IRIS, colored membrane of the eye.

IRRIGATION, constant application of water.

IRRITATION, excitement ; stimulation.

ISOLATE, to separate one from another.

JACKSONIAN EPILEPSY, epileptiform convulsions of limited extent.

JACTITATION, restlessness.

JAUNDICE, yellow coloration of the skin.

JEJUNUM, upper two-fifths of the small intestines.

JUGULAR VEINS, large veins of the neck.

KIDNEY, the organ secreting urine.

KINETIC, that which produces motion.

KLEPTOMANIA, a morbid desire to steal.

KOUMISS, fermented milk.

LABARRAQUE'S SOLUTION, a solution of chlorinated soda,

LABIA, the lips.

LABORATORY, a place for experimental work.

LABYRINTH, the internal ear.

LACERATION, rendering ; tearing.

LACHRYMAL, pertaining to tears.

LACTAGOGUE, agent inducing milk secretion.

LACTATION, time of suckling.

LACTEAL, pertaining to milk.

LACTIN, sugar of milk.

LACTOSE, lactin.

LACUNÆ, small cavities in bones.

LAMELLA, a thin plate or scale.

LAMINA, a thin layer or scale.

LANCET, a two-edged surgical knife.

LANCINATE, to pierce or incise.

LANCINATING, piercing ; darting.

LAPAROTOMY, an abdominal incision.

LARYNGEAL, pertaining to the larynx.

LARYNGITIS, inflammation of the larynx.

LARYNGOSCOPE, an instrument for examination of the larynx.

LARYNX, upper part of windpipe ; organ of voice.

LASSITUDE, weakness ; exhaustion.

LATENT, concealed ; not manifest.

LATERAL, pertaining to the side.

LAUDANUM, tincture of opium.

LAVAGE, washing out of the stomach.

LAXATIVE, a mild purgative.

LEECH, a blood-sucking worm.

LENTICULAR, pertaining to the lens.

LEPER, one affected with leprosy.

LEPROSY, malignant disease of skin.

LESION, change from injury or disease.

LETHARGY, a condition of drowsiness.

LEUCOCYTE, a white blood corpuscle.

- LEUCOCYTHEMIA, abnormal increase in the white corpuscles.
- LEUCOCYTOSIS, transient increase in the number of white corpuscles.
- LEUCORRHEA, whitish discharge from the vagina.
- LEVATOR, a muscle that elevates a part.
- LIGAMENT, a band of fibrous tissue.
- LIGATURE, material used for tying.
- LINEAR, pertaining to a line.
- LINGUAL, shaped like the tongue.
- LINIMENT, a liquid ointment for external use.
- LINT, prepared linen for dressing wounds.
- LIQUEFACTION, conversion into liquid.
- LIQUOR, a liquid solution.
- LITHIASIS, formation of a calculus.
- LITHOTOMY, incision into the bladder for stone.
- LITMUS, blue pigment turned red by acids.
- LIVID, black and blue.
- LOBAR, pertaining to a lobe.
- LOBE, rounded division of an organ.
- LOBULE, a small lobe.
- LOCAL, limited to a part.
- LOCALIZATION, determining the seat of a disease.
- LOCHIA, vaginal discharge after labor.
- LOCKJAW, tetanus.
- LOCOMOTION, animal movement.
- LOCOMOTOR ATAXY, tabes dorsalis ; disease of spinal cord.
- LOINS, lower part of back.
- LONGEVITY, long life.
- LOTION, solution for external use.
- LOZENGE, a sweet medicated tablet.
- LUBRICATION, making smooth or slippery.
- LUCID, clear ; unobscured.
- LUMBAGO, pain in the loins.
- LUMBAR, pertaining to the loins.
- LUNACY, insanity.
- LUNAR CAUSTIC, silver nitrate in stick.
- LUNATIC, one affected with insanity.
- LUXATION, dislocation ; out of joint.
- LYING-IN, being in childbirth.
- LYMPH, fluid in lymphatics.
- LYMPHANGITIS, inflammation of the lymphatics.
- LYMPHATIC, pertaining to lymph.
- LYSIS, gradual decline of a disease.
- MACERATION, steeping in fluid.
- MACROCEPHALUS, having a large head.
- MACROSCOPIC, visible to the naked eye.
- MACULA, a spot or small patch.
- MALADY, any illness or disease.
- MALAISE, a feeling of uneasiness or discomfort.
- MALAR, pertaining to the cheek-bone.

MALARIA, the specific cause of  
ague.

MALFORMATION, abnormal shape  
or structure.

MALIGNANT, virulent ; fatal.

MALINGERER, one feigning injury  
or illness.

MALPOSITION, abnormal position  
of a part.

MAMMA, the breast.

MAMMARY, pertaining to the  
breasts.

MANIA, delirium or madness.

MANIA A POTU, delirium tremens.

MANIACAL, having the nature of  
madness.

MANICURE, a chiropodist.

MANIPULATION, manual treat-  
ment.

MARASMUS, a wasting or emacia-  
tion.

MARGINAL, pertaining to, or at  
the border of.

MARROW, fatty substance of a  
long bone.

MASCULINE, of the male gender.

MASSAGE, methodical pressure of  
the body.

MASTICATION, the process of  
chewing.

MATERIA MEDICA, substances  
used as medicines.

MATTER, physical substance ; pus.

MATURATION, ripening,

MAXILLARY, pertaining to the  
jaws.

MEASLES, rubeola.

MEATUS, a passage ; opening.

MEDIAN, middle or mesial.

MEDICAMENT, a medicine.

MEDICINE, a remedial agent.

MEDIUM, surrounding conditions.

MEDULLA, fatty substance in  
various cavities.

MEDULLARY, pertaining to the  
medulla.

MEGRIM, hemicrania ; sick head-  
ache.

MEIBOMIAN GLANDS, sebaceous  
glands of the eyelids.

MELANCHOLIA, depression of  
spirits ; gloominess.

MEMBRANA TYMPANI, the drum-  
membrane of the ear.

MEMBRANOUS, having the nature  
of a membrane.

MENIERE'S DISEASE, disease of  
the semicircular canals of the  
ear, with vertigo.

MENINGES, membranes of the  
brain and spinal cord.

MENINGITIS, inflammation of  
the meninges.

MENOPAUSE, end of the menstrual  
life.

MENORRHAGIA, excessive men-  
strual flow.

MENSES, monthly flow from the  
womb.

MENSTRUAL, pertaining to men-  
struation.

MENSTRUATION, function of the  
female producing menstrual  
flow.

MENSTRUUM, a solvent.

MENTAL, pertaining to the mind.

MERCURIAL, pertaining to mer-  
cury.

- MESENTERIC, pertaining to the mesentery.
- MESENTERY, peritoneal attachment of the small intestines.
- MESIAL, same as median.
- MESMERISM, hypnotism.
- METABOLISM, change in the condition of cells ; nutrition.
- METACARPUS, bones in the palm of the hand. [change.
- METAMORPHOSIS, structural
- METASTASIS, change in the seat of disease.
- METATARSUS, bones in the arch of the foot.
- METRE, unit of measure of the metric system.
- METRITIS, inflammation of the uterus.
- MIASM, noxious emanation.
- MICROBE, a micro-organism.
- MICROCEPHALOUS, having a small head.
- MICROCOCCLUS, a genus of germs.
- MICRO-ORGANISM, a minute living body.
- MICROSCOPE, an instrument to examine minute objects.
- MICTURITION, act of voiding urine.
- MIDRIFF, the diaphragm.
- MIGRAINE, sick headache.
- MILIARY, like millet seeds.
- MINIM, about a drop ;  $\frac{1}{80}$  of a fluid drachm.
- MISCARRIAGE, abortion.
- MITRAL, left valve of the heart.
- MOBILITY, property of being easily moved.
- MOLAR TEETH, back grinding teeth.
- MOLECULE, smallest quantity of a substance.
- MONOCULAR, pertaining to one eye.
- MONOMANIA, insanity on one subject.
- MONOPLEGIA, paralysis of a single limb.
- MONSTROSITY, a deformed foetus.
- MORBID, pertaining to disease.
- MORPHINISM, state produced by morphine used excessively.
- MORTIFICATION, gangrene ; putrefaction.
- MORTUARY, a morgue.
- MOTOR, applied to muscles moving apart.
- MUCILAGE, a thick viscid liquid.
- MUCUS, secretion of mucous membrane.
- MULTIPARA, a woman who has borne several children.
- MULTIPLE NEURITIS, inflammation of many nerves.
- MUMPS, inflammation of the parotid.
- MURMUR, a low sound heard in auscultation.
- MUSCLE, contractile tissue.
- MUSCULAR, pertaining to muscle.
- MUTILATION, loss of a membrane or organ.
- MYALGIA, pain in the muscles.
- MYDRIASIS, abnormal dilatation of the pupil.
- MYELITIS, inflammation of the spinal cord.

- MYOPIA, near-sightedness.
- MYXEDEMA, a disease with mucus-like dropsy.
- NÆVUS, birth-mark ; a congenital, cutaneous blemish.
- NARCOSIS, anæsthesia from narcotics.
- NARCOTIC, a hypnotic allaying pain.
- NASAL, pertaining to the nose.
- NASAL FOSSÆ, the nasal passages.
- NATES, the buttocks.
- NAUSEA, sickness at the stomach.
- NAUSEOUS, producing nausea.
- NECROSIS, death of tissue.
- NEOPLASM, new growth of tumor.
- NEPHRECTOMY, excision of kidney.
- NEPHRITIS, inflammation of the kidneys.
- NERVOUS, pertaining to nerves.
- NEURAL, pertaining to nerves.
- NEURALGIA, pain in a nerve.
- NEURASTHENIA, exhaustion of nerve force.
- NEURITIS, inflammation of a nerve.
- NEUROSIS, nervous affection without lesion.
- NEUTRALIZE, to render negative.
- NIDUS, a cluster.
- NIGHTMARE, horror during sleep.
- NITROGEN, a colorless, gaseous element.
- NOCTURNAL, pertaining to the night.
- NODULE, a small knob or excrescence.
- NORMAL, according to rule or type.
- NOSTALGIA, homesickness.
- NOSTRILS, the nares.
- NOXIOUS, harmful ; poisonous.
- NUCLEUS, a vesicular body in a cell.
- NUT-GALL, used in medicine as an astringent.
- NUTRIENT, nutritious substance.
- NUTRIMENT, anything that nourishes.
- NUTRITIVE, affording nutrition.
- NYSTAGMUS, jerking movement of the eyeballs.
- OBESE, condition of fatness.
- OBESITY, fatness, corpulency.
- OBJECTIVE, preceptible to the senses.
- OBLIQUE, slanting.
- OBSERVATION, examination and recognition of symptoms.
- OBSTETRICS, care of women during child-birth.
- OCCIPUT, the back part of the head.
- OCCCLUSION, blocking up of an opening.
- OCULAR, pertaining to the eye.
- ODONTALGIA, toothache.
- ODONTOID, resembling a tooth.
- OINTMENT, a soft, fatty, medicated mixture.
- OLEAGINOUS, having the nature of oil.
- OLEATE, oleic acid and a base.
- OLECRANON, head of the ulna.
- OLFACTION, the sense of smell.



- OLFACTORY, pertaining to olfaction.
- OMENTUM, peritoneum covering the viscera.
- OPACITY, non-transparency.
- OPAQUE, impervious to light.
- OPERATION, surgical procedure.
- OPHTHALMIA, inflammation of the conjunctiva.
- OPHTHALMOLOGIST, an oculist.
- OPHTHALMOSCOPE, instrument to examine the inside of the eye.
- OPIATE, an opium preparation.
- OPISTHOTONOS, spasmodic rigidity in which the trunk is thrown backward.
- OPPRESSION, sense of pressure.
- OPTIC, pertaining to vision.
- ORAL, pertaining to the mouth.
- ORBICULAR, circular.
- ORBIT, bony cavity for the eyeball. [being.
- ORGANISM, a living, organized
- ORIFICE, mouth or entrance.
- ORTHOPÆDIC, correction of deformity.
- OS, the mouth. A bone.
- OSCILLATION, a tremulous motion.
- OSMOSIS, diffusion of fluids through membranes.
- OSSEOUS, bony ; resembling bone.
- OSSIFICATION, formation of bone.
- OSTEITIS, inflammation of bone.
- OS UTERI, mouth of womb.
- OTITIS, inflammation of the ear.
- OVAL, egg-shaped ; elliptical.
- OVARIOTOMY, excision of an ovary.
- OVARY, organ of generation in the female.
- OXALURIA, presence of calcium oxalate in urine.
- OXIDATION, conversion into an oxide.
- OXYGEN, one of the gaseous elements.
- OXYGENATION, saturation with oxygen.
- OZÆNA, fetid nasal discharge.
- OZONE, antiseptic and oxidizing agent.
- PABULUM, anything nutritive.
- PACHYDERMATOUS, thick-skinned.
- PACHYMENINGITIS, inflammation of the dura mater.
- PALATE, roof of the mouth.
- PALLIATIVE, mitigating ; relieving.
- PALLOR, paleness.
- PALMAR, pertaining to the palm.
- PALPATION, exploration with the hand.
- PALPITATE, to flutter, or beat abnormally fast.
- PALSY, loss of sensation or voluntary motion.
- PANACEA, a cure-all.
- PANADA, bread soaked in water.
- PANCREAS, the sweetbread.
- PANG, a sharp momentary pain.
- PAPILLA, small conical eminence.
- PAPULE, small elevation of the skin.
- PARACENTESIS, tapping of a body cavity.

- PARALYSIS, loss of sensation or voluntary motion.
- PARALYSIS AGITANS, paralysis with constant tremor of muscles.
- PARALYTIC, pertaining to paralysis.
- PARANOIA, chronic form of insanity with delusions.
- PARAPLEGIA, paralysis of lower half of body.
- PARASITE, organism infesting the body.
- PAREGORIC, a camphorated tincture of opium.
- PARENCHYMA, essential substance of an organ.
- PARENCHYMATOUS, pertaining to parenchyma.
- PARESIS, slight paralysis.
- PARÆSTHESIA, a morbid or altered sensation.
- PARIETAL, pertaining to a wall.
- PAROTID, a gland under the ear.
- PAROXYSM, a spasm or fit.
- PARTURIENT, the condition of being in labor.
- PARTURITION, the act of giving birth to young.
- PASSION, intense emotion.
- PASSIVE, not active.
- PASTEURIZATION, destruction of microbic life.
- PATELLA, a round bone in front of the knee.
- PATHOGENIC, causing disease.
- PATHOGNOMIC, characteristic, peculiar to. [eases.
- PATHOLOGY, the science of dis-
- PATIENT, a sick person.
- PATULOUS, expanded ; open.
- PECTORAL, pertaining to the breast.
- PEDIATRICS, medical treatment of children.
- PEDICLE, the stalk or attachment of a tumor.
- PEDILUVIUM, a foot-bath.
- PEDUNCLE, a supporting part.
- PELLICLE, a thin membrane.
- PELVIC, pertaining to the pelvis.
- PELVIS, bony basin of the trunk.
- PENETRATING, entering beyond the surface.
- PEPSIN, the digestive principle of gastric juice.
- PERCEPTION, conscious impressions through the senses.
- PERCOLATION, process of filtration.
- PERCUSSION, diagnosis by striking the body.
- PERFORATION, an opening or penetration.
- PERICARDIUM, membranous sac around the heart.
- PERINEUM, space between the thighs.
- PERIOD, an interval of time.
- PERIOSTEUM, nutritive membrane surrounding bones.
- PERIPHERY, the circumference.
- PERISTALSIS, vermicular motion of the bowels.
- PERITONEUM, serous membrane lining abdomen.
- PERITONITIS, inflammation of the peritoneum.

- PERIVASCULAR, surrounding a vessel.
- PERNICIOUS, highly destructive ; fatal.
- PEROXIDE, an oxide with highest amount of oxygen.
- PERSPIRATION, sweat.
- PERTUSSIS, a contagious disease with a convulsive whooping-cough.
- PES, a foot.
- PESSARY, instrument placed in the vagina to support the uterus.
- PESTILENCE, a plague,
- PETECHIA, purple spots on the skin.
- PETROUS, resembling stone.
- PEYER'S GLANDS, clustered glands in the small intestine.
- PHAGOCYTOSIS, destruction of microbes by the action of white corpuscles.
- PHALANGES, bones of the fingers and toes.
- PHARMACY, the science of drugs.
- PHARYNGEAL, pertaining to the pharynx.
- PHARYNGITIS, inflammation of the pharynx.
- PHARYNX, space behind the mouth.
- PHENOL, carbolic acid.
- PHENOMENON, a symptom.
- PHLEBITIS, inflammation of a vein.
- PHLEBOTOMY, opening of a vein ; venesection.
- PHLEGMASIA, inflammation.
- PHOSPHATE, a salt of phosphoric acid.
- PHOTOPHOBIA, dislike or dread of light.
- PHRENIC, pertaining to the diaphragm.
- PHTHISIS, pulmonary consumption.
- PHYSICAL, pertaining to the body.
- PHYSIOGNOMY, reading character by the face.
- PIA MATER, vascular membrane of brain and cord.
- PIGMENT, organic coloring matter.
- PIPETTE, a small graduated tube for taking up liquids.
- PLACEBO, an inert drug given to satisfy patients.
- PLACENTA, the after-birth.
- PLANTAR, pertaining to the sole of the foot.
- PLASMA, fluid part of the blood.
- PLASTIC, capable of being moulded.
- PLEDGET, a small, flat compress of lint.
- PLETHORA, abnormal fulness of the blood vessels.
- PLEURA, serous membrane enveloping the lungs.
- PLEURISY, inflammation of the pleura.
- PLEURODYNIA, pain in the intercostal muscles.
- PLEURO-PNEUMONIA, inflammation of the pleura and lung.
- PLEXUS, a network of veins or nerves.
- PNEUMATIC, pertaining to gaseous fluids.

- PNEUMOGASTRIC, pertaining to lungs and stomach.
- PNEUMONIA, inflammation of the lungs.
- PNEUMOTHORAX, gas or air in the pleural sac.
- POLLUTION, masturbation; befouling.
- POLYPUS, a tumor found in the nose, ear, rectum, etc.
- POLYURIA, excessive secretion of urine.
- POPLITEAL, pertaining to the ham.
- PORE, a small opening in the skin.
- POROUS, having pores.
- POST-MORTEM, after death.
- POST-PARTUM, after parturition.
- POTION, a draught.
- POTT'S FRACTURE, fracture of the fibula.
- POULTICE, a soft, external application.
- PRECIPITATE, a substance separated by precipitation.
- PREDISPOSITION, a natural tendency.
- PREGNANCY, the condition of being with child.
- PREMONITORY, indicating the onset of disease.
- PRESCRIPTION, a formula written by a physician.
- PRIMIPARA, woman pregnant with her first child.
- PRINCIPLE, essence of a body.
- PROBANG, a rod with a sponge attached.
- PROBE, a small instrument for examining wounds.
- PRODROME, a forerunner or sign of a disease.
- PROGNOSIS, prediction of course and end of disease.
- PROLIFIC, fruitful.
- PROMINENCE, any conspicuous protuberance.
- PROSTATE GLAND, neck of the bladder in the male.
- PROSTRATION, extreme nervous exhaustion.
- PROTECTIVE, an antiseptic dressing for wounds.
- PROTUBERANCE, a projecting part.
- PROUD-FLESH, excessive granulations.
- PRURIGO, skin disease with great itching.
- PRURITIS, intense itching.
- PSOAS, the loins.
- PSORIASIS, skin disease with scale formation.
- PSYCHIATRY, treatment of mind diseases.
- PSYCHICAL, pertaining to the mind.
- PSYCHOSES, diseases of the mind.
- PTOMAINES, putrefactive animal alkaloids.
- PTOSIS, drooping of the upper eyelid.
- PTYALISM, excessive secretion of saliva.
- PUBERTY, age of capability of reproduction.
- PUBES, anterior portion of the pelvis.
- PUBIC, pertaining to the pubes.
- PUERILE, pertaining to childhood.

- PUERILE RESPIRATION, child-like respiration.
- PUERPERAL, pertaining to childbirth.
- PULMONARY, PULMONIC, pertaining to the lungs.
- PULSATION, a beating or throbbing sensation.
- PULSE, impulse of the arteries.
- PULVERIZATION, act of reducing to a powder.
- PUNCTATE, having many points, dotted.
- PUNCTURE, a wound made by a pointed instrument.
- PUNGENT, acrid, penetrating.
- PUPIL, the round opening of the eye.
- PUPILLARY, pertaining to the pupil.
- PURGATION, evacuation of the bowels.
- PURULENT, having the character of pus.
- PUS, the fluid product of suppuration.
- PUSTULE, a small, purulent papule.
- PUTREFACTION, organic decomposition ; decay.
- PUTRID, showing putrefaction ; rotten.
- PYÆMIA, septicæmia with abscess formations.
- PYLORIC, pertaining to the pylorus.
- PYLORUS, lower orifice of the stomach. [ing pus.
- PYOGENIC, developing or secreting
- PYOTHORAX, pus in the pleural cavity.
- PYRAMIDAL, shaped like a pyramid.
- PYRETIC, pertaining to fever.
- PYREXIA, elevation of temperature ; fever.
- PYRIFORM, pear-shaped.
- PYROMANIA, insanity tending to incendiarism.
- PYROSIS, gastric burning pain with eructations.
- QUADRICEPS, a large muscle of thigh ; with four parts.
- QUALITATIVE, pertaining to quality.
- QUANTITATIVE, pertaining to quantity.
- QUARANTINE, debarring persons from infected places.
- QUINSY, an acute severe inflammation of the tonsils with fever.
- QUOTIDIAN, intermittent fever with daily paroxysm.
- RABIES, corresponding to hydrophobia in man.
- RACHITIS, rickets.
- RADIUS, the small bone of the forearm.
- RAMIFICATION, branching of an organ or part.
- REACTION, responsive action ; action of reagent.
- RECTUM, lower part of the large intestines.
- RECUPERATION, return to health.
- REFLECTION, bending back of a part.

- REFLEX, involuntary action from nerve stimulus.
- REGENERATION, new growth or repair of lost tissues.
- REGIMEN, the methodical use of food.
- REGURGITATION, an eructation or throwing back.
- RELAPSE, recurrence of a disease during convalescence.
- RELAXATION, diminution of tension.
- REMISSION, the period of abatement in fever.
- REMITTENT, alternately abating and returning.
- RENAL, pertaining to the kidneys.
- RESECTION, excision of a portion of bone.
- RESOLUTION, absorption.
- RESORPTION, absorption of morbid deposits.
- RESPIRATION, inspiration and expiration of air by the lungs.
- RESPIRATORY, pertaining to respiration.
- RESUSCITATION, the bringing to life of an asphyxiated person.
- RETINA, internal membrane of eye, the expansion of optic nerve.
- RETRACTION, shortening.
- RETROFLEXION, a bending or flexing backward.
- RETROVERSION, turning back.
- RHEUMATISM, a disease with fever, pain, inflammation, and swelling of the joints.
- RHEUMATOID, resembling rheumatism.
- RHINITIS, inflammation of the nasal mucous membrane.
- RICKETS, inflammation of the spine.
- RIGOR, coldness ; stiffness ; rigidity.
- RIGOR MORTIS, rigidity after death.
- RUBEFACIENT, an agent that reddens the skin.
- RUBEOLA, measles.
- RUGA, a wrinkle.
- SACCHARIFEROUS, containing sugar.
- SACCULATED, divided into sacs.
- SACRUM, large triangular bone above coccyx.
- SAINT ANTHONY'S FIRE, erysipelas.
- SALINE, salty.
- SALIVA, secretion of the salivary glands.
- SALT-RHEUM, chronic eczema.
- SALUBRIOUS, healthful.
- SANGUINE, bloody ; hopeful.
- SANGUINEOUS, bloody.
- SANITARY, pertaining to health.
- SAPID, savory.
- SAPONACEOUS, having the nature of soap.
- SARCOMA, a tumor of connective tissue.
- SATURATION, holding in solution all capable of being contained.
- SAVORY, having a pleasant odor or taste.

SCABIES, the itch.

SCAPULA, the large flat bone of the shoulder.

SCARFSKIN, the epidermis.

SCARIFICATION, making small incisions on a part.

SCHIZOMYCETES, bacteria.

SCIATICA, neuralgia of the sciatic nerve.

SCIRRHUS, a hard form of cancer.

SCLEROTIC, hard, indurated.

SCORBUTUS, scurvy.

SCOURGE, any severe epidemic disease.

SCROFULA, a constitutional condition with tubercular tendency.

SCROFULOUS, affected with scrofula.

SCROTUM, the pouch containing the testes.

SCULTETUS, BANDAGE OF, a many-tailed bandage.

SCURVY, a disease due to deficient and improper diet.

SEBACEOUS, pertaining to fat or suet.

SECONDARY HÆMORRHAGE, hæmorrhage after operation.

SECRETION, function of glands.

SECRETORY, performing secretion.

SEDATIVE, soothing.

SEDENTARY, occupied in sitting.

SEDIMENT, matter settling from a liquid.

SEGMENT, a small piece.

SEMI-CIRCULAR CANALS, curved passages of the internal ear.

SEMILUNAR VALVES, valves of the aorta and pulmonary artery.

SENILITY, weakness of old age.

SENSATION, corporeal feeling.

SENSORY, pertaining to sensation.

SEPSIS, putrefaction.

SEPTICÆMIA, absorption of septic products.

SEPTIC, relating to putrefaction.

SEQUELA, supervening disease.

SEROUS, having the nature of serum.

SERRATED, notched like a saw.

SIALAGOGUE, agent increasing flow of saliva.

SIBILANT, hissing, wheezing.

SIGH, a prolonged, deep inspiration. [disease.

SIMULATION, counterfeiting of SINAPISM, a mustard plaster.

SINUOUS, wavy, winding.

SINUS, canal leading to an abscess. Cavity within a bone.

SITOPHOBIA, insanity, with abhorrence for food.

SITZ-BATH, bath in a sitting posture.

SLAVERING, dribbling of saliva.

SLOUGH, separated dead matter in an ulceration.

SNUFFLES, catarrhal discharge from the nose.

SOLUBLE, capable of being dissolved.

SOLUTION, diffusion of a solid in a liquid.

SOLVENT, an agent capable of dissolving substances.

SOMNOLENT, inclined to sleep.  
SOPORIFIC, an agent inducing sleep ; hypnotic.  
SORDES, collection about the teeth.  
SPASM, a convulsive muscular contraction.  
SPATULA, blade for spreading ointments.  
SPECIFIC, peculiar, special.  
SPECIFIC GRAVITY, weight of a substance compared with that of water.  
SPIRAL, screw-like.  
SPIRILLUM, a genus of bacteria.  
SPLEEN, oval viscus behind the outer end of the stomach.  
SPLINT, support for the ends of a fractured bone.  
SPONGY, porous.  
SPONTANEOUS, taking place without aid or volition.  
SPORADIC, occurring in isolated cases.  
SPRAIN, violent straining of ligaments.  
SPUTUM, expectorated matter.  
SQUAMOUS, scabby.  
STERILITY, the condition of being barren.  
STERILIZATION, destruction of germs by heat.  
STERNUM, the flat bone of the breast.  
STERTOROUS, breathing with a sonorous sound.  
STETHOSCOPE, a tube for conveying sounds in auscultation.  
STHENIC, strong, active.

STIMULANTS, agents increasing functional activity.  
STIMULUS, anything exciting an organ.  
STOMATITIS, inflammation of the mouth.  
STRABISMUS, eye-squint.  
STRANGULATED HERNIA, hernia so compressed as to be irreducible.  
STRANGURY, painful urination in drops.  
STREPTOCOCCUS, micrococci in chains.  
STRICTURE, a contraction of a duct or tube.  
STRUCTURE, composition of an organ.  
STRUMOUS, scrofulous.  
STUPOR, the condition of insensibility.  
STYPTIC, an astringent ; hæmstatic.  
SUBACUTE, of moderate severity.  
SUBJECTIVE, internal ; pertaining to one's self.  
SUBLIMATE, CORROSIVE, bichloride of mercury ; an antiseptic.  
SUBLINGUAL, beneath the tongue.  
SUBSULTUS, morbid tremor or twitching.  
SUDORIFEROUS, carrying sweat.  
SUFFOCATION, stoppage of respiration.  
SUICIDE, to kill one's self.  
SUPERFICIAL, confined to the surface.  
SUPERIOR, the upper part.  
SUPINE, lying flat, or on the back.



- SUPPOSITORY, solid medicine for introduction in rectum or vagina.
- SUPPRESSION, retention.
- SUPPURATION, the formation of pus.
- SUSPENDED ANIMATION, temporary cessation of vital functions.
- SUTURE, in surgery, a stitch.
- SWOON, faint.
- SYMPATHETIC, series of ganglia in body.
- SYMPHYSIS, junction of bones.
- SYMPTOM, phenomenon or sign of disease.
- SYMPTOMATIC, pertaining to a symptom.
- SYNCHRONOUS, occurring at the same time.
- SYNCOPE, swooning or fainting.
- SYNOVIA, lubricating fluid of a synovial membrane.
- SYNOVITIS, inflammation of a synovial membrane.
- SYPHILIS, a chronic, infectious venereal disease.
- SYRINGE, an instrument for injecting fluids.
- SYSTEMATIC, methodical.
- SYSTEMIC, pertaining to a system.
- SYSTOLE, contraction of the heart and arteries.
- TABES DORSALIS, degeneration of spinal cord; locomotor ataxy.
- TACHYCARDIA, abnormal rapidity of the heart.
- TACTILE, pertaining to the sense of touch.
- TÆNIA, intestinal worms.
- TALIPES, club-foot.
- TAMPON, a plug of lint or cotton, etc.
- TAPPING, taking effusion from a cavity.
- TARSUS, the instep.
- TARTAR, a deposit from saliva upon the teeth.
- TAXIS, manual reduction of a hernia.
- TEMPERAMENT, individual peculiarity.
- TEMPERATURE, intensity of heat.
- TEMPORAL, pertaining to the temple.
- TENACULUM, a hook-shaped instrument.
- TENDON, white fibrous tissue, the attachment of muscles.
- TENESMUS, rectal pain with spasmodic straining.
- TENOTOMY, section of a tendon.
- TENSION, strain of an organ.
- TERTIAN, intermittent paroxysm occurring every third day.
- TETANUS, a disease with spasmodic and continuous contraction of the muscles.
- THEIN, active principle of tea; caffein.
- THEOMANIA, religious mania.
- THERAPEUTICS, the application of remedies.
- THERMIC, pertaining to heat.
- THERMIC FEVER, heatstroke.

- THERMOMETER, an instrument for measuring intensity of heat.
- THIGH, upper portion of the leg.
- THIGH-BONE, the femur.
- THORACIC, pertaining to the chest.
- THORAX, the cavity above the abdomen.
- THROMBOSIS, formation of a thrombus.
- THROMBUS, blood-clot in a vessel.
- THYROID GLAND, glandular body at the upper part of trachea.
- TIBIA, inner and larger bone of the leg.
- TIC DOULOUREUX, spasmodic facial neuralgia.
- TINCTURE, an alcoholic solution of medicinal substance.
- TINEA, a skin disease, from fungi.
- TINNITIS AURIUM, ringing in the ears.
- TISSUE, any web-like structure.
- TOLERANCE, capacity of enduring a drug.
- TONIC, promoting nutrition and tone.
- TONSILLITIS, inflammation of the tonsils.
- TOPOGRAPHY, description of regions of the body.
- TORMINA, griping pain in the bowels.
- TORPOR, abnormal inactivity.
- TORSION, a twisting.
- TOURNIQUET, an instrument to compress arteries.
- TOXÆMIA, poisoned state of the blood.
- TOXIC, poisonous.
- TRACHEA, the wind-pipe.
- TRACHEOTOMY, incision of the trachea.
- TRACTION, a drawing or pulling.
- TRANCE, a form of catalepsy.
- TRANSFUSION, transfer of blood into the veins.
- TRANSUDATION, oozing of a fluid through the pores of the skin.
- TRANSVERSE, lying across.
- TRAUMATIC, pertaining to a wound.
- TREMOR, involuntary trembling of the body.
- TREPHINE, a cylindrical saw for entering the skull.
- TRICEPS, a muscle with three origins.
- TRICHINIASIS, disease caused by trichina in the body.
- TRICUSPID, having three points, as the right valve of the heart.
- TRISMUS, lockjaw.
- TROCAR, a sharp instrument for paracentesis.
- TROPHIC, pertaining to nutrition.
- TRUSS, an apparatus to hold a hernia in place.
- TUBE, a pipe-like structure in the body.
- TUBERCLE, a small nodule of granular cells.
- TUBERCULAR, pertaining to tubercles.
- TUBERCULOSIS, infectious disease due to specific bacillus.
- TUMEFACATION, swelling of a part.
- TUMOR, a swelling.

TURGESCEENCE, swelling of an organ.

TURGID, swollen.

TYMPANITES, gaseous distension of the abdomen.

TYMPANITIC, drum-like.

TYMPANUM, the middle-ear cavity, and membrane.

TYPHOID, resembling typhus.

TYPICAL, characteristic.

ULCER, an open sore.

ULCERATION, process of ulcer formation.

ULNA, large bone of the forearm.

UMBILICUS, the navel.

UNDULATORY, moving like waves.

UNGUENT, an ointment. [side.

UNILATERAL, affecting but one

URATE, combination of uric acid with a base.

UREA, chief solid constituent of urine.

URÆMIA, toxic condition of the blood from accumulation of urea.

URETER, a tube carrying urine from kidney to bladder.

URETHRA, the excretory canal of the bladder.

URIC ACID, an acid normally found in urine.

URINALYSIS, analysis of urine.

URINARY, pertaining to the urine.

URINE, fluid secreted by the kidneys.

URINOMETER, instrument for finding specific gravity of urine.

URTICARIA, nettle-rash.

UTERINE, pertaining to the uterus.

UTERUS, the womb.

UVULA, a soft body pendent from the free border of the palate.

VACCINATION, inoculation with vaccine to protect against small-pox.

VACCINE, lymph from a cow-pox vesicle.

VACCINIA, cow-pox, a vesicular disease of cows.

VACUUM, a space exhausted of air.

VAGUS, the pneumogastric nerve.

VALVE, fold across a canal obstructing passage in one direction.

VAPOR, the gaseous form of a substance.

VAPORIZATION, conversion of a substance into a vapor.

VARICELLA, chicken-pox.

VARICOSE, affected with varix.

VARIOLA, small-pox.

VARIOLOID, a modified form of small-pox.

VARIX, a venous dilatation.

VASCULAR, pertaining to vessels.

VASO-MOTOR, causing motion in vessels.

VEHICLE, medium of administration.

VEIN, a vessel returning the blood to the heart.

VENEREAL, pertaining to sexual intercourse.

VENESECTION, opening a vein.

- VENOUS, pertaining to a vein.  
 VENTILATION, the supplying of fresh air.  
 VENTRICLE, as of the heart.  
 VERMICULAR, worm-like.  
 VERMIFORM, having a shape like a worm.  
 VERMIFUGE, an agent expelling intestinal worms.  
 VERSION, turning of the foetus in utero.  
 VERTEBRA, a bony segment of the spinal column.  
 VERTEBRAL COLUMN, the spinal column; the back bone.  
 VERTEBRATE, having vertebræ.  
 VERTEX, superior region of the skull.  
 VERTIGO, giddiness; dizziness.  
 VESICAL, pertaining to the bladder.  
 VESICLE, a small blister or sac.  
 VESSEL, a tube to convey the fluids of the body.  
 VIABILITY, ability to live.  
 VIAL, a vessel or bottle.  
 VIBRATION, a swinging back and forth.  
 VICARIOUS, taking the place of another.  
 VILLI, small projection of mucous membrane of small intestines.  
 VINOUS, having the nature of wine.  
 VINUM, wine.  
 VIRULENT, having the nature of a poison.  
 VIRUS, a morbid product.  
 VISCERA, the contents of the body cavities.  
 VISCID, glutinous, ropy.  
 VISION, sight.  
 VISUAL, pertaining to vision.  
 VITAL, pertaining to life.  
 VOCAL, pertaining to the voice.  
 VOLATILE, readily evaporating.  
 VOLUNTARY, under the control of the will.  
 VOMIT, to eject from the stomach.  
 VORACIOUS, having an insatiable appetite.  
 VULVA, the external female genitals.  
 WET-NURSE, a woman who suckles the child of another.  
 WET-PACK, reducing temperature by wrapping in a wet sheet.  
 WIND-PIPE, trachea.  
 XYPHOID, sword-like.  
 YAWNING, deep inspiration; gaping.  
 YEAST, a minute, fungous ferment.  
 ZERO, point from which thermometers are graded.  
 ZYGOMA, the arch formed by the cheek bones.  
 ZYMOTIC, pertaining to a pathogenic microbe.



## GENERAL INDEX OF VOLS. I. AND II.

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